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OF THE

BROOKLYN ENTOMOLOGICAL SOCIETY

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J. R. de la TORRE-BUENO

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WILLIAM T. DAVIS.

FRIEND OF ALL THE WORLD.

He is gone from us, from the sweet-scented lanes, from the sun-drenched fields he loved so well, from the uncounted hosts of friends who loved him! The fullness of years had not dimmed his eagerness, nor had age dulled his mind.

American entomology has suffered a great loss. But great as this loss is to science, the death of William Davis is a far deeper loss to the friends of this kindly, friendly, unassuming simple man.

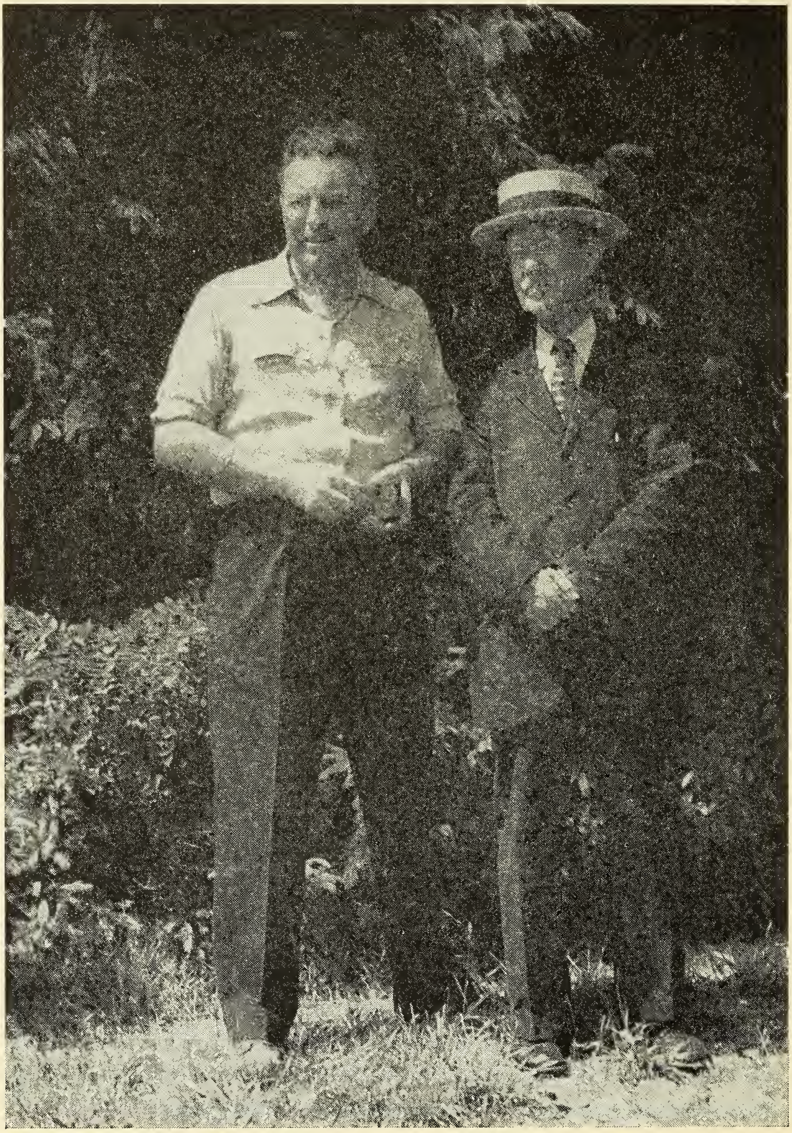
William T. Davis was the field naturalist *par excellence.* In the heart of nature, in field and forest and stream, was his true abiding place. Here he knew everyone of their shy little denizens, and each of their abiding places. The swiftly speeding bird, the chirping insect, the cryptic lizard, the towering tree, the lowly lichen, all had a name to him; all were his intimates.

The warm and kindly earth he loved so well has called him to its bosom. He knows at last the never-ending peace that passeth understanding.

His treasured memory will be sweet and living to his friends, until the last of us joins him in eternal rest!

J. R. T.-B.

MAY 14 '45



The last picture of William T. Davis, with Edwin Way Teale

THE SAYINGS OF WILLIAM T. DAVIS.

By Edwin Way Teale, Baldwin, L. I., N. Y.

Those of us who knew and loved William T. Davis must find new significance in the old phrase: *We will know his like no more.* We will, to be sure, meet other men who are kindly. We will meet other men who are sincere. We will meet other men who are gifted and conscientious scientists. But none can ever combine—in one inimitable whole—the gentle charm, the sturdy integrity, the helpful considerateness, the wisdom and the enduring enthusiasm of this well-remembered friend.

No one said things exactly the way he did. There was freshness in his phrases. He had a gift for putting wisdom in a new package. His sayings were memorable, humorous, wise. They reflected the originality of his outlook, the flavor of his personality. Here, without any attempt at segregation, I will set down some of the remembered sayings of William T. Davis. Appearing thus, following each other without any particular relation to those coming before or after, they may have something of the random charm, the unstudied extemporaneousness with which they spiced his conversations.

"Politicians should study astronomy. Then they wouldn't feel so big."

"I never use two straws in an ice-cream soda—it's gone too quick."

"If that vireo had asked my advice, it never would have built its nest there!"

"Staten Island has 57 square miles—one for each of Mr. Heinz' pickles."

"I throw rocks with my left hand, write with my right hand, chop wood left-handed, and pin insects with both hands. I am a very curious creature."

"The cloud formations seem to show a preference for the map of Cuba."

"I tell you, jewelers have nothing on bugs—some of their eggs are wonderfully beautiful."

"Automobiles all look alike to me. They are like box turtles."

"Starlings are lawyer-birds. They say 'fee-you.' "

"I used to know my goldenrods but now I forget. Getting old is too bad."

"Wobbly characters take what they call 'honest graft.' "

"God bless Woolworth's. They help me a great deal, especially in the matter of notebooks."

"Most newspapers should be called 'The Daily Distress.' "

"Let me say a good word for the cockroach. It cleans up dirty sinks."

"A tick has to get on me, suck blood, then drop off and later in life attach itself to another animal. That's pretty precarious. If a tick thought about it, it would end up by having nervous prostration!"

"It's fine to hear the rain pouring down. The harder it rains, the sooner it will be over."

"All cats are ornithologists."

"How old is that specimen? Well, one Davis is pretty old. He always saves everything and some of these specimens were collected when he was twenty years old."

"I have never been very clever but I have always been rather constant."

"Oh, at one time, we had *beautiful* snakes on Staten Island."

"Each morning, I wash my face with Ivory soap. One of the owners of that company is interested in collecting insects."

"Dermestids dearly love a dragonfly."

"The first car I ever rode in was an air-cooled Franklin that didn't drink water."

"I was born on the twelfth of October. Yes, Christopher Columbus did me the honor of discovering America on my birthday."

"The automobile is as great an invention as the Waterbury watch."

"There goes the best-dressed man on Staten Island. If he heard me say that, he would feel greatly complimented. And I'm sure I don't know why!"

"I can always spell a word at least three or four ways."

"Girls in shorts must provide a fine Christmas dinner for the Culex."

"A naturalist must rather be right than President."

" 'Father' Leng's beetle boxes are becoming dermestid hotels. I will have to put in some kill-um-dead."

"When I was younger, a doctor told me I had TB and advised me to go and live in the pine barrens. I'm glad to say he was wrong. When you get old, everything is breaking down and it doesn't matter; but when you are young and all your parts are going full speed and then just one of them breaks down, it is pretty hard on you."

"The only cicada that was named after me is a *terrible* pest in the South."

"The main virtue of boneset tea is its terrible taste."

"This crooked trail must have been laid out by a snake. Maybe a cow went first. But a snake certainly finished it off."

"For many years, 'Father' Leng got shaved in a barber shop. And he learned a great deal there, too, no doubt."

"If I were only seventy-five again, I'd be all right!"

"When you are 82, you are not much of a candidate for vittels."

"I must have been a sissy boy as I never gave my parents much trouble."

"That's one of my idiosyncrasies. I couldn't spell the word but I could write a book about it."

"Annie Trumbull Slosson was a great woman. I could pat myself on the head—right on that bald spot—because she once spoke well of me. To have Annie Trumbull Slosson say I was all right, was a kind of diploma."

"A red-eyed vireo is a preacher bird. He tells you all about yourself and what you should do."

"Man, in spite of all the bad things he has done, is more kindly disposed towards his fellows than almost any other kind of creature."

"There is no hurry. There is still tomorrow, all untouched."

"Why, in this picture I really look like a kindly old man!"

"With an automobile, you are kind of handicapped in getting around."

"I ought to tell you that I am not hunchbacked. My spinal curvature is a butterfly net under the back of my coat."

"I wouldn't trust Nature out of my sight. She will play a trick on you every chance she gets."

"It is true that big dragonflies have been known to treat each other unkindly."

"The identifying part of this cicada looks as though a land turtle had walked up to a head of cabbage and taken out a bite."

"An old fellow is likely to talk sixteen to a dozen and keep it up too long."

"It is dangerous to be too specialized. If anything happens to the particular prey you depend upon, you are lost. I would rather be a cockroach and eat anything!"

On our last trip afield together, a month before he went to the hospital, we stood looking at a cow switching her tail.

"I'll bet," he said, "that that cow has to eat grass for an hour a day just to run that fly-swatting machine!"

"When I was collecting material for a history of Staten Island with 'Father' Leng," he told me another time, "we copied this inscription from the gravestone of Sarah Post, a naturalist who lived from 1796 to 1867." The inscription, as he gave it to me then, well expresses the outlook of William T. Davis' own life. Its two lines read:

"Lord, 'tis a pleasant thing to stand
In gardens planted by Thy hand."

A DAY AFIELD ON STATEN ISLAND.

By Wm. T. Davis.

The glorious sun is setting
In the far and distant west,
And the clouds all golden laden
Seem sinking down to rest.

The day was one of glory and
The sun did brightly shine;
No heart in all the wildwood
Has been so glad as mine.

I went where fancy led me,
For fancy is broad and wild
I stayed where beauty kept me,
For beauty is soft and mild.

But the glorious sun is setting,
And the day is no longer mine;
Could I but turn the hour-glass
And hold the sands of time!

A NEW SPECIES OF PSEUDOMETHOCA (MUTILLIDAE) FROM THE WEST INDIES.

By R. M. Schuster, Cornell University, Ithaca, New York.

Only a very few species of Mutillidae have been described from the Antilles, and all of these, as far as known, are indigenous to one island. Among these have been three species of *Pseudomethoca*. A fourth species is described below, and it has been considered expedient to give a short key to the West Indian species, in order to facilitate their recognition.

Key to Species of Pseudomethoca.

1. Male; entirely black, except for reddish-tinged base of second tergite. (St. Vincent). . . *Pseudomethoca unicincta* Ashm.
   Females 2
2. Integument of head and thorax entirely blackish 3
   Head ferruginous or testaceous 4
3. Head very densely, conspicuously silvery pubescent; second tergite with two large spots of cinereous pubescence; tergites 4–6 silvery pubescent; sternites silvery pubescent; otherwise largely black pubescent; the legs and antennae testaceous; no red on second tergite. (St. Croix). *Pseudomethoca* **olgae** sp. n.
   Sparsely white pubescent, mixed with black hairs; second tergite of abdomen with broad apical band of red; legs nearly black, the tarsi testaceous. (St. Vincent). *Pseudomethoca unicincta* Ashm.
4. Head ochraceous pubescent; second tergite ferruginous, the basal lateral angles almost black, lacking spots; thorax dark throughout; first abdominal tergite without median spot of silvery pubescence. (Cuba) . . *Pseudomethoca salti* Mickel
   Head yellow or testaceous, with fine silky silvery pubescence; thorax anteriorly and laterally partly ferruginous; second tergite with three ferruginous spots; petiole with a median apical silvery spot. (Haiti). *Pseudomethoca flaviceps* (Andre)

Pseudomethoca olgae sp. n.

Female: Length 5.5–6 mm. Blackish, the apical abdominal segments lighter; the legs and antennae testaceous; the head and two large spots on the second abdominal tergite silvery pubescent; tergites 4–6, the sternites and posterior propodeal face similarly, but sparsely so; the thoracic notum and second tergite (except spots) and tergite three largely black pubescent.

Head very large, swollen, transversely rectangular seen above, dark brown to blackish, clothed with a very dense vestiture of appressed and decumbent silvery hairs, hiding the sculpture dorsally; width 1.6 mm. (wider than maximum length of alitrunk); genae less densely pubescent, sparsely, finely punctate, a lighter brown in color, carinate weakly behind, but not spinose or dentate produced. Mandibles acuminate dentate.

Thorax obpyriform, blackish, except for the testaceous legs, clothed with sparse decumbent blackish pubescence above, except for the posterior propodeal face, which is silvery pubescent. Rather coarsely, very closely, contiguously to confluently punctured, the punctures quite deep; maximum width 1.14 mm. (less than 0.8 the width of the head.) Somewhat in front of the metathoracic spiracles the dorsolateral angles of the thorax are produced as a strong, but small, acute tooth on either side; the propodeum has three teeth on its lateral edges, the upper and lower very weak, the median prominent. Posterior propodeal face polished and shining, except for small setigerous sparse punctures. Legs testaceous, silvery pubescent. Posterior tibiae with two rows of four spines each; calcaria white.

Petiole silvery-pubescent; except for the apex medially, which is black pubescent. Second tergite black pubescent, and entirely of a black integumentary color, but the disk with two large triangular spots of dense silvery hairs, the points of the triangle facing each other medially, and separated from each other by an area of black pubescence. Apical tergites progressively less darkly pigmented, the third black pubescent, the apical tergites silvery pubescent, with narrow median areas with black hairs. The sternites entirely silvery pubescent; second sternite with punctures moderate, in transverse rows.

Holotype: United States Experiment Station, St. Croix, Virgin Islands, April 19, 1922 (C. E. Wilson), in collection of Cornell University, Type No. 2195.

This beautifully marked species is very different in general facies from any other West Indian species.

The pair of very prominent, silvery pubescent spots of the second tergite and the conspicuously and densely swollen silvery pubescent head easily separate this species from any other known species of *Pseudomethoca.* It is named in honor of my wife, Olga M. Schuster.

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AMATEURS.

By J. C. Bradley, Ithaca, N. Y.

A pleasing editorial in the October Bulletin supports the work of amateur entomologists, as has always been its policy. Class distinctions are not praiseworthy and in scientific work have no place. Let amateur and professional bear in mind that the value of their contributions is neither measured by salary or title, nor lack of them, but by the skillful assembly of facts, the discovery of those that are new, and the grade of interpretative thought brought to bear upon them. Will it help to break down distinction between amateur and professional to look a little more deeply into who they are?

The largest class of professional entomologists are the men employed by insecticide companies, by Experiment Stations, and by the Federal Government to carry on investigations bearing upon the control of pests, on apiculture and on other problems of interest to the economy of mankind. The work for which they are paid is published in governmental bulletins and in the Journal of Economic Entomology. They may like their work or merely tolerate it, as with any other individual earning a livelihood. But when they go beyond the duties for which they are paid, and produce revisions and other "non-economic" contributions, which numbers of them do and always have done, they do so with all the love and enthusiasm of any amateur, and often at expense of their evenings and other non-working hours. The point is, that in such work they *are* amateurs, just as truly as though the work for which they receive their salaries happened to be banking, or something else.

Outside of economic workers, almost the only other class of professionals are teachers, most of them employed primarily to teach zoology or biology rather than entomology, so they rank as professionals in biology rather than as entomologists. Their case is about the same, they are paid to teach; if they undertake work in systematic entomology or the like, it may or may not be officially "encouraged," but the chances are that it will be done at sacrifice of vacations and non-working hours; and they will count themselves blessed if some part of it can be crowded into ordinary "office hours." Are not they, too, in their research work by definition, Amateurs?

The museum-men, of whom there are not many, are not in very different case; they are paid to take care of collections; some are allowed time, as a matter of museum prestige, for taxonomic work, others "encouraged" to carry it on out-of-hours.

Finally there are the graduate students. They are not being paid for doing research, but are paying for the privilege. That outdoes any Amateur; probably they should be defined as "super-amateurs"!

The point is, that our civilization has not reached the point of paying more than a very few individuals for any type of entomological study that is not aimed quite directly at the improvement of man's estate, and that all other entomological work is done by men who bear a spark of the enthusiasm that has produced the great amateurs of the past, and that is an inner compulsion that will not be denied.

If there is any distinction of significance it is not between professional and amateur, but the purely individual one of the amount of training that can be brought to bear upon the solution of a given problem. If by training we mean broad knowledge of the principles and discipline of biology (of which, let us never forget, entomology is merely a part) and of the cumulative experience of biologists, there is no gainsaying that its possessor is the better equipped for successful research, particularly for interpretative thinking; it may be gained in many ways, and is far from always being successfully absorbed from exposure to collegiate channels. For those who feel themselves handicapped, there are innumerable problems of painstaking and faithful observation of facts of life history, of ecology, of morphology, of distribution and of taxonomy which can only accumulate by the cooperation of many, many workers, and which form the basis of all progress.

Why then not forget about distinctions? Outside of strictly "economic" entomological work, we are all amateurs at heart, and if a man can carry on studies of insect-life when earning his bread and butter in some unrelated field, all the more honor to his indomitable energy.

If we *must* distinguish, we might redefine the professional entomologist as the paid entomological worker who starts his work at 9:00 A. M., takes his hour off for lunch, and stops punctually at four or five, then devotes his off-hours and vacations to something that has no relation to insects. The rest of us, and that would surely include every one who ever publishes in the BULLETIN, would rate for the honorable apellation of amateur!

REVISION OF THE TRIBE PACHYPEZINI (COLEOPTERA, CERAMBYCIDAE).

By Lawrence S. Dillon and Elizabeth S. Dillon, *Reading, Pa.*

In monographing the Onciderini,[1] the authors encountered several genera which were in discord with the other elements of the tribe; in order to relocate these properly, it became necessary to study various other related groups. The present revision is an outgrowth of one of these problems.

Material in the collections of the Carnegie Museum [C.M.] formed the largest part of the basis for the undertaking; other collections examined are as follows: Academy of Natural Sciences of Philadelphia [A.N.S.P.]; Lionel Lacey, New Rochelle; and the American Museum of Natural History [A.M.N.H.]. Our thanks go to all the curators of these collections, whose kindnesses have made this study possible.

As here defined, Pachypezini is removed from the Hippopsini, where they had been placed by Lacordaire as a subtribe, and is elevated to tribal rank, and excludes all the genera formerly included except the typical genus. To this has been added the genus *Helvina,* formerly in the Onciderini. The group thus formed differs from the Hippopsini s.s. in several important characters: antennae less elongate, heavily fringed beneath, scape never passing the middle of the pronotum; head not elongate, with antennal tubercles very prominent; eye with lower lobe large, oblong, strongly vertical, never transverse, the upper lobes much wider than isthmus; prosternal processes behind procoxae narrow; meso- and metasternum not elongate; and elytra with apices separately rounded, at most feebly acuminate, never spined nor acicularly acuminate, humeri more prominent. From the other genera formerly included near *Pachypeza* (*Hippopsicon, Auloconotus,* and *Pothyne,* etc., for which the authors propose the name Hippopsiconini, trib. nov.), the present tribe differs chiefly as follows:

> Procoxae placed well behind middle of prothorax; pronotum transversely carinate on entire disk; head with front feebly convex when viewed from side, without longitudinal carinae on vertex; elytral apices rounded, not truncate; antennae with a dense, long fringe on proximal segments; eye with upper lobe broader than isthmus; mesosternum gradually inclined to me-

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[1] Dillon, L. S. and E. S. Dillon, The Tribe Onciderini, Part I; Reading Publ. Mus. Sci. Pub., 5, 1945, p. I–XV, 1–186.

socoxal acetabula anteriorly, not sulcate there. (The opposite of these characters will distinguish the Hippopsiconini from the Hippopsini as well.)

From all the related tribes, the members of the Pachypezini are distinguishable in several, largely sexual, peculiarities. In the male the pronotum is elongate, whereas in the female it is slightly transverse; the former sex has the metafemora and metatibiae strongly compressed and, on the procoxae, there is a flange on the lateral surface near the insertion of the femur. This latter character is present to some degree in certain females, too.

From the Onciderini, the Pachypezini differ in the above sexual characters; the pro- and mesosternal processes narrow; the legs short; the procoxae confined to the basal half of prothorax; and the front of the head inclined at a greater angle than the anterior margin of the prothorax, when viewed from the side.

KEY TO GENERA.

Antennal tubercles approximate; body form more elongate ...... *Pachypeza*
Antennal tubercles widely separated; body form robust .. *Helvina*

Helvina Thomson

Helvina Thomson, Syst. Cerambyc., 1864, p. 103. Lacordaire, Gen. Col., IX, 1872, p. 688.

This genus differs from *Pachypeza* in these respects: the body form is less elongate and more robust; antennal tubercles widely spaced; antennae only slightly longer than body in male, and not as long as body in female; species of this genus are granulate-punctate or granulate on the base of the elytra; no white lateral vitta is present on pronotum.

Elongate-oblong, rather robust, cylindrical. Head viewed from above less than half as long as pronotum or as its own width at base; front elongate, narrowed gradually to epistoma, slightly inclined posteriorly; eye with lower lobe oblong, at least twice genal height, upper lobes well separated; antennal tubercles distant, more so in female than in male; robust, unarmed at apex in either sex. Pronotum subquadrate in male, slightly transverse in female, widest near middle, base and apex subequal in width, sides unarmed but with a cluster of setigerous granules just behind middle, anterior margin straight; basal and apical transverse sulcus distinct; disk transversely rugose. Scutellum transverse. Elytra with sides nearly parallel, apices separately broadly rounded; disk at base granulate or granulate-punctate; humeri rather prominent, angle rounded, usually tuberculate. Legs short, middle ones shortest; procoxae one half (or slightly more) the length of prothorax, in male sometimes tuberculate on mesal surface, laterally with a strong flange in the same sex; femora clavate, robust, profemora in male expanded on mesal surface on distal half, less distinctly so in female; tibiae short, metatibiae and metafemora in male strongly compressed. Antennae slightly longer than body in male, nearly equal to body length in female, rather densely fimbriate on basal five segments, thence to apex sparsely so; scape cylindrical, very gradually wider apically; third segment cylindrical, straight, one third longer than first; rest gradually shorter, tenth and eleventh segments subequal, not elongate.

Genotype: Helvina uncinata Thomson, by original designation and monotypy.

KEY TO SPECIES.

1. Elytra sparsely, rather coarsely granulate at base, unicolorous, with scattered, small, glabrous maculae .... *uncinata*
Elytra densely granulate-punctate at base, bicolorous, without glabrous maculae 2
2. Head and pronotum ashy-gray pubescent; elytra finely, densely granulate-punctate basally; only abdominal sternites 1 and 2 brown maculate laterally .... *lanuginosa*
Head and pronotum yellowish- or rosy-gray pubescent; elytra more coarsely, more or less rugosely granulate-punctate; abdominal sternites 1, 2, and 3 brown maculate laterally .. **lypera**

Helvina uncinata Thomson (Pate I, Fig. 6)

Helvina uncinata Thomson, Syst. Ceramb., 1864, p. 103.

Male: Elongate-oblong, cylindrical, rather robust; fuscous, uniformly covered with tawny-gray pubescence, denser around eyes; genae dark brown pubescent; elytra with a number of moderate sized, round, glabrous maculae irregularly scattered over surface (these are tubercles basally); abdomen on each side of first and second sternites with a broad, oblique, dark brown macula that extends onto metacoxae, hind legs and mesotibiae apically dark brown pubescent, metafemora glabrous on mesal surface.

Head above finely punctate, with a few coarser ones medially, a median line extending from occiput to epistoma; front elongate, one half again as long as wide, a little wider above, finely punctate; genae transverse, more or less rugosely punctate; eye with lower lobe very large, at least twice as tall as gena, oblong; antennal tubercles widely separated, slightly prominent, robust, unarmed. Pronotum as long as greatest width, narrowed basally and apically, basal and apical transverse sulcus narrow, straight, rather deep; disk entirely covered with coarse, irregular rugosities, only a few of which are interrupted; sides just above angulation of procoxae with several small prominent tubercles, the anterior one largest. Scutellum transverse, apex broadly rounded. Elytra nearly parallel-sided, apices separately rounded; on basal quarter with a number of coarse, shining tubercles, irregularly placed and variable in number and size; humeri slightly prominent, anterior margin arcuate, slightly oblique, angle with a feebly elevated, obtuse tubercle. Prosternum rather narrow, gradually wider posteriorly; mesosternal process narrow, elongate, at apex feebly emarginate; abdomen with fifth sternite a little longer than fourth. Legs short, front pair more elongate; procoxae with flange broad and elongate, lower edge arcuate, apex acute; femora robust, clavate, profemora subpedunculate, strongly expanded on mesal surface on apical third, metafemora strongly compressed; metatibiae compressed, broad; protarsi slightly dilated. Antennae slightly longer than body, eighth segment attaining elytral apex, densely fringed beneath on third to fifth segments, more sparsely so on first two and from sixth to eleventh; scape moderately robust, subcylindrical, a little wider apically; third nearly straight, one third longer than first; fourth slightly longer than first, rest subequal.

Female: As in male but pronotum slightly wider than long, less tapering to base and apex, on sides tubercles less distinct; legs a little longer, procoxae with flange very short, profemora unmodified, metafemora less compressed, metatibiae not compressed, protarsi not dilated; antennae with ninth segment attaining elytral apex; abdomen with fifth sternite much larger than fourth, broadly grooved medially.

Length 19–26 mm.; width 5.6–8 mm.

Type locality: Cayenne.

Distribution: The Guianas and lower Amazon region. French Guiana: ♀; Cayenne; [M.C.Z.]. Brazil: ♂, 2 ♀; Santarem; [C. M.].

Helvina lanuginosa Bates (Pate I, Fig. 7)

Pachypeza lanuginosa Bates, Ann. Mag. Nat. Hist., (3), XVI, 1865, p. 314 (sep. p. 200).

Male: Elongate-oblong, cylindrical, rather robust; medium to dark reddish-brown. Head and pronotum ashy-gray pubescent, genae dark brown pubescent. Scutellum and elytra on basal fourth and narrowly on sides ashy-gray pubescent, remainder of surface grayish-brown pubescent, with minute, scattered spots of ashy-gray. Beneath ashy-gray pubescent, first and second sternites of abdomen broadly maculate laterally with dark brown. Antennae dark reddish-brown, grayish-brown pubescent, the apex of scape and third with ashy-gray. Legs dark reddish-brown, first two pairs grayish-brown pubescent, hind ones dark brown pubescent, except the tarsi which are grayish-brown; metafemora glabrous on mesal surface.

Head above with a few, coarse, shallow punctures between antennal tubercles; a median impressed line from occiput to epistoma; front elongate, distinctly narrowed to epistoma, surface with scattered, coarse, shallow punctures; genae transverse; eyes with lower lobe oblong, three times genal height; antennal tubercles slightly prominent, well-separated. Pronotum subquadrate, distinctly narrowed basally and apically, widest at middle; an apical and a basal sulcus present, apical one wide, shallow; disk with many distinct, irregular, transverse carinae which are continued laterally to prosternum, at middle basally with a few coarse granules; laterally at base with a cluster of small granules bearing setae. Scutellum transverse, sides and apex broadly arcuate. Elytra with sides nearly straight, apices each broadly rounded; basal fourth finely and densely granulate-punctate, granules on humeri forming rugosities, remainder of surface finely, densely punctate, the punctures becoming smaller and less dense apically; humeri slightly prominent, anterior margin arcuate, feebly oblique, angle with a large, feebly elevated tubercle. Prosternum simply rounded, much narrowed between procoxae; mesosternal process narrow, slightly widened and feebly emarginate apically; fifth sternite subtruncate apically, distinctly longer than fourth. Legs moderately long; procoxae globose, with the procoxal flange short but distinct; profemora greatly expanded on mesal surface of apical half, base narrow and coarsely rugose, metafemora and tibiae much compressed; protarsi dilated. Antennae with eighth segment attaining elytral apex; scape moderately robust, subcylindrical, slightly wider apically; third segment nearly straight, one third longer than scape, fourth slightly longer than scape, remaining segments gradually shorter, eleventh slightly shorter than tenth; moderately fimbriate on first five segments, more densely on apex of third, fourth, and fifth.

Female: More robust; pronotum feebly transverse, very feebly narrowed apically and basally; fifth sternite feebly triangularly impressed medially; procoxae only minutely flanged; femora clavate, profemora more robust, metafemora compressed slightly; metatibiae dilated feebly; antennae with ninth segment attaining elytral apex.

Length 17–22.2 mm.; width 5.2–7 mm.

Type locality: Egá and São Paulo [deOlivença], Upper Amazon, Brazil.

Distribution: The Amazon Region. Brazil: 2 ♂; 2 ♀; Santarem; [C.M.].

Helvina lypera Dillon and Dillon, spec. nov. (Plate I, Fig. 8)

Resembles *H. lanuginosa* but the bases of elytra are rugosely granulate-punctate; the head and pronotum and elytral maculation either yellowish- or rosy-gray instead of ashy-gray; first, second, and third sternites dark brown maculate.

Male: Elongate-oblong, robust, cylindrical; piceous. Head, pronotum, and scutellum dull yellowish- or rosy-gray pubescent, eyes margined with same pubescence but denser. Elytra grayish-brown pubescent, with very small, irregular maculae of yellowish- or rosy-gray pubescence scattered over the surface, these denser on basal third, lateral margin with a narrow, indistinct vitta of same pubescence. Beneath piceous, clothed with yellowish- or rosy-gray pubescence, first, second, and third sternites laterally dark brown maculate, macula much narrower on third. Antennae piceous, grayish-brown pubescent. Legs piceous, first and second pairs yellowish or fulvous-gray pubescent, hind ones dark brown pubescent; metafemora glabrous on mesal surface.

Head above with a few coarse, shallow punctures on occiput and vertex, a median impressed line from occiput to near epistoma; front elongate, sides gradually but distinctly narrowed below, surface with a few coarse punctures; genae transverse; eye with lower lobe broadly oblong, nearly twice genal height; antennal tubercles slightly prominent, widely separated. Pronotum subquadrate, distinctly narrowed apically and basally; apical and a basal sulcus moderately deep; disk more or less regularly, transversely carinate, the carinae continuing laterally nearly to prosternum, laterally and medially at base with a few punctate granules. Scutellum transverse; sides straight or nearly so; apex subtruncate. Elytra with sides nearly straight, apices each broadly rounded; disk with basal fourth rather coarsely, rugosely granulate-punctate, thence coarsely punctate to middle, remainder of surface more finely and sparsely punctate; humeri slightly prominent, anterior margin arcuate, feebly oblique, angle simply rounded. Prosternum narrow, simply rounded, widened basally; mesosternal process narrow, feebly widened apically, apical margin barely emarginate; fifth sternite longer than fourth, very feebly emarginate at apex. Legs moderate; procoxae globose, procoxal flange moderate; profemora strongly swollen on mesal surface of apical half, basal third narrow and roughly rugose; metafemora and tibiae strongly compressed; protarsi dilated. Antennae very slightly longer than body; scape subcylindrical, moderately robust, slightly widened apically; third segment straight, one third longer than scape, fourth slightly longer than scape, remaining segments gradually shorter; eleventh very slightly longer than tenth; fimbriate on all eleven segments, but more heavily so on third, fourth, and fifth.

Female: More robust; pronotum feebly transverse, very feebly narrowed apically and basally; fifth sternite shallowly, triangularly impressed at apex; procoxae feebly but distinctly flanged; femora clavate, profemora basally with a few rugosities and with mesal surface feebly swollen, metatibiae only very feebly dilated, protarsi slightly dilated; antennae distinctly shorter than body, eleventh segment shorter than tenth.

Length 16.5–20.5 mm.; width 4.5–7.75 mm.

Holotype: Male; Satipo Valley, Junin Prov., Peru, Aug-Sept., 1940; [L. Lacey].

Allotype: Female; Same data as type; [L. Lacey].

Paratypes: Female; topotypic; [L. Lacey]. Female; Chaco, Bolivia; [A.N.S.P.].

Pachypeza Serville.

Pachypeza Serville, Ann. Soc. Ent. France, IV, 1835, p. 42. Castelnau, Hist. Nat. Col., II, 1840, p. 493. Blanchard, Hist. Nat. Ins., II, 1845, p. 162. Thomson, Class. Ceramb., 1860, p. 120; Syst. Ceramb. 1864, p. 390. Bates, Ann. Mag. Nat. Hist. (3), XVI, 1865, p. 314 (sep. p. 200). Lacordaire, Gen. Col., IX, 1872, p. 691, 692.

Elongate-ovate, slender, cylindrical. Head viewed from above more than one half as long as wide at base and more than one half as long as pronotum; front elongate, narrowed above, strongly inclined posteriorly; eye with lower lobe broadly oblong, distinctly taller than gena, upper lobes subapproximate; antennal tubercles approximate, robust, prominent, armed at apex, at least in male. Pronotum slightly elongate in male, feebly transverse in female, widest behind middle, apex a little narrower than base, usually with a feeble tubercle each side well behind middle, anterior margin emarginate at middle; transverse sulci obsolete; disk transversely rugose. Scutellum transverse. Elytra feebly tapering posteriorly, apices separately rounded, often subacuminate; disk at base simply punctate (in *phegea* granulate-punctate); humeri slightly prominent, angle broadly rounded, not tuberculate. Legs short, posterior ones shorter than forelegs, middle pair shortest; procoxae robust, no more than one half the length of prothorax, in male sometimes with tubercle on mesal surface, laterally in same sex with a distinct flange; femora clavate; tibiae often shorter than femora; metafemora and metatibiae in male strongly compressed. Antennae one and one half to two times as long as body in male, from one and one third to one and one half times body length in female, heavily fringed beneath on proximal five segments, tufted on apices of rest; scape cylindrical, feebly expanded apically; third segment distinctly longer than first, straight, rest gradually shorter, in male eleventh much elongate.

Genotype: Saperda pennicornis Germar, by original monotypy.

KEY TO SPECIES

1. Elytra with lateral margins in great part white tomentose . . . 3
Elytra not white tomentose on sides 2
2. Elytra together with five complete bright ochraceous vittae and two white ones; pronotum with median vitta ochraceous; body form small and very slender . . . . *teres*
Elytra with no complete vittae, discal ones tawny, greatly broken, sutural one white, only attaining middle; pronotum with median vitta white; body form larger and broader . . **joda**
3. Elytra at base simply punctate, maculation not entirely white 4
Elytra granulate-punctate at base, maculae entirely white **phegea**
4. Elytra with numerous distinct white and yellowish vittae on

disk, basal punctation not coarse, punctures well spaced *pennicornis*

Elytra without any discal vittae, with numerous yellowish maculae there, basal punctation coarse, more or less rugose, punctures rather densely placed .... *marginata*

Pachypeza pennicornis Germar (Plate I, Fig. 1)

Saperda pennicornis Germar, Ins. Spec. Nov., 1824, p. 490.

Pachypeza pennicornis Germar. Castelnau, Hist. Nat. Col., II, 1840, p. 493. Lacordaire, Gen. Col. IX, 1872, p. 692.

Male: Elongate-oblong, slender, cylindrical; dark reddish-brown to fuscous, densely covered with dark brown pubescence, with orange-fulvous vittae as follows: a double one on middle of head above, one each side of front, pronotum with one at middle and three on each side of disk, elytra each with four or five oblique, interrupted ones and abdomen with two each side. A broad white tomentose vitta on each side of body from behind eye along sides of thorax and continuing along margin of each elytron to near apex, attenuate at each end. Short streaks or maculae of white on middle of pronotum, sides of scutellum, and scattered over elytra.

Head above minutely, densely punctate, with a median line from occiput to near epistoma; front about twice as long as greatest width, strongly and regularly narrowed above, slightly emarginate below lower margin of eye, minutely punctate; genae slightly transverse; eyes with lower lobe large, nearly twice the height of gena and about as broad as front, oblong; antennal tubercles prominent, robust, approximate, shortly toothed at apex. Pronotum nearly cylindrical, slightly longer than wide, a little narrowed toward base, side at basal fourth with a minute tubercle; disk with a large number of transverse carinae, mostly uninterrupted but a few central ones often broken each side of middle; basal transverse sulcus narrow, distinct, apical one broad, obsolete. Scutellum a little broader than long, sides feebly oblique, apex broad, notched at middle. Elytra elongate, feebly tapering posteriorly, apices subacuminate and separately narrowly rounded; disk basally finely, deeply, not densely punctate, punctures finer and shallower from basal quarter to middle, thence obsolete to apex; humeri prominent, anterior margin strongly rounded. Legs rather short; procoxae prominent, anteriorly at sides with an elongate, recurved flange, ending in an acute angle, toward mesal surface with an obtuse tubercle; femora robust, slightly clavate, metafemora strongly compressed, on mesal surface shining; metatibiae strongly compressed, distinctly expanded apically. Antennae elongate, seventh segment attaining elytral apex, very densely fringed beneath from first to fifth segments, thence more sparsely so to distal end, apex of each of these distal segments more heavily fringed than basally; scape rather robust, cylindrical; third segment half again as long as first, fourth one third longer than first, rest gradually shorter, except tenth, which is slightly longer than ninth, and eleventh, which is longest of all (in small specimens antennae may be as in female).

Female: As male, but pronotum a little wider than long; procoxae with flange very short, the tubercle wanting; metafemora and metatibiae unmodified; antennae only slightly longer than body, tenth and eleventh segments subequal.

Length 13–23 mm.; width 3–5.5 mm.

Type locality: Brazil.

Distribution: Southeastern Brazil and Paraguay. Brazil: ♀; no locality data; [U.S.N.M.]. 4 ♂, ♀; Rio de Janeiro; [C.M.–4 ♂; U.S.N.M.–♀]. ♀; Chapada; [C.M.]. 2 ♀; Hansa Humboldt, Santa Catharina, Nov.–Dec.; [Lionel Lacey]. Paraguay: ♂; San Bernardino; (K. Fiebrig); [U.S.N.M.].

Pachypeza marginata Pascoe (Plate I, Fig. 2)

Pachypeza marginata Pascoe, Trans. Ent. Soc. Lond. 1888, p. 507.

Resembles *P. pennicornis* very closely, differing from it mainly in having the antennae a little shorter, the elytra more coarsely and densely punctate and lacking all trace of pubescent vittae on disk; eye with lower lobe only slightly taller than gena.

Male: Elongate-oblong, slender, cylindrical; dark reddish-brown to fuscous, sparsely covered with dark brown or ashy-brown pubescence. Head above with an indistinct fulvous median vitta, a broader distinct one behind each lower lobe of eye, which may be fulvous, white, or both colors; front sparsely fulvous pubescent, densely so each side. Pronotum with five, indistinct, narrow, fulvous vittae on disk, one apically at middle, one each side of middle, converging and coalescent at base, and one toward each side; a broad, white vitta each side just above procoxae, narrower apically. Elytra rather variegated with fulvous on scutellar region; disk, especially apically, with several rows of sparse, small fulvous maculae; on side margins from about basal quarter a broad white vitta, terminating before apex. Body beneath dark brown to fuscous, brown or ashy pubescent, sides of mesosternum and the mesosternal side-pieces, and metepisternum densely white tomentose; abdomen with two more or less macular, narrow, fulvous vittae each side. Legs fuscous, fuscous pubescent. Antennae dark reddish-brown, only very slightly paler distally, covered with dark brown pubescence.

Head with a median line from occiput to near epistoma; front elongate, rather narrow, tapering above; gena slightly elongate; eye with lower lobe broadly oblong, a little taller than gena; antennal tubercles robust, prominent, approximate, at apex with a short tooth. Pronotum elongate, slightly wider at base than at apex, widest behind middle, minutely tuberculate at basal fourth; transverse sulci obsolete; disk covered with many irregular transverse rugosities. Scutellum transverse, nearly oblong, apex broad, feebly arcuate. Elytra elongate, parallel-sided, apices separately broadly rounded, slightly acuminate or not at all so; disk at base densely, coarsely, more or less rugosely punctate, punctures from basal quarter gradually finer and sparser, much finer behind middle; humeri feebly prominent, its anterior margin distinctly rounded, the angle without a tubercle. Procoxae with a short distinct flange, toward mesal surface a rather prominent tubercle; femora robust, clavate, metafemora strongly compressed; metatibiae robust, slightly compressed. Posternum narrow between the coxae; mesosternal process elongate, narrow, feebly notched at apex; fifth sternite slightly longer than fourth, apex broadly emarginate. Antennae nearly half again as long as body, seventh segment nearly attaining elytral apex, with a long, rather dense fringe beneath, on distal segments fringe gradually sparser; scape robust, cylindrical, nearly attaining apical fourth of pronotum; third segment almost one and one half times as long as first, rest gradually shorter, tenth slightly longer than ninth, eleventh much longer.

Female: Pronotum slightly transverse; procoxae without flange and tubercle, metafemora clavate and metatibiae unmodified; fifth sternite much longer than fourth, with a broad feeble excavation toward apex, which is truncate; antennae only slightly longer than body, eighth segment nearly attaining elytral apex, tenth and eleventh segments not elongate.

Length 16–17 mm.; width 4 mm.

Type locality: Brazil.

Distribution: Southeastern Brazil. Brazil: ♀; Rio Grande do Sul; [A.N.S.P.]. ♂; Nova Teutonia, Nov. 11, 1938; (Fritz Plaumann); [L. Lacey]. ♀; Santa Catharina; [A.N.S.P.].

Pachypeza phegea Dillon and Dillon, spec. nov. (Plate I, Fig. 3)

Distinct from the two preceding species in that the lateral, white, tomentose vitta of elytra begins at the humerus, the discal maculation is entirely whitish; and the front lacks the usual lateral vittae.

Male: Elongate-oblong, rather slender, cylindrical; fuscous, all over densely, dark brown pubescent. Head with a small patch at angle of isthmus and a narrow vitta behind isthmus of dense white tomentum. Pronotum with a continuation of the lateral vitta of head, which is widest basally. Elytra medially with a broad area along suture of small, scattered, irregular, white maculae, these denser from basal third, laterally with a dense white vitta which only attains the apical fourth. Beneath fuscous, dark brown pubescent, sterna medially and abdomen, except laterally on first sternite, grayish pubescent; meso- and metasterna laterally with a dense white vitta. Legs piceous, densely clothed with dark brown pubescence and with scattered single white hairs. Antennae piceous with thin dark brown pubescence.

Head above with a few, coarse, shallow punctures, a median impressed line from occiput to near epistoma; front elongate, gradually narrowed below, surface coarsely densely punctate, punctures deep, and with finer punctures interspersed; genae distinctly elongate, surface scabrous; eye with lower lobe wide, trapezoidal, narrowed below, about one eighth longer than gena; antennal tubercles prominent, appproximate, dentate on posterior end of mesal side. Pronotum feebly elongate, widest basally; transversely carinate all over disk; sides feebly obtusely armed behind middle. Scutellum transverse, sides straight, oblique, apex feebly emarginate. Elytra with sides straight, apices separately, broadly rounded, basal fourth finely, densely granulate-punctate, remaining surface with moderate punctures, becoming slightly finer apically; humeri slightly prominent, angle simply rounded. Prosternum narrow, simply rounded, widened basally; mesosternal process narrow, subtruncate apically; fifth sternite slightly longer than fourth, at apex strongly emarginate. Legs moderate; procoxae globose, with an obtuse tubercle anteriorly, flange feeble; femora robust, profemora rugose basally, metafemora feebly compressed; metatibiae moderately compressed; protarsi feebly dilated. Antennae about one half longer than body; scape robust, cylindrical, slightly wider apically; third segment straight, cylindrical, nearly half again as long as scape; fourth slightly longer than scape; remaining segments gradually shorter, except eleventh which is distinctly longer than tenth and curved.

Length 17 mm.; width 4.2 mm.

Holotype: Male; Coxim, Matto Grasso, Brazil, October, 1939; (A. Maller); [L. Lacey].

Pachypeza joda Dillon and Dillon, spec. nov. (Plate I, Fig. 4)

The following two species differ from all the preceding in lacking the lateral white vittae on the elytra. The present species differs from *P. teres* in the elytra having no entire discal vittae, all vittae broken and yellowish, the sutural one is white and only attains middle; moreover, its size is much larger and its form more robust.

Male: Elongate-oblong, slender, cylindrical; head and pronotum dark reddish-brown, elytra paler. Head and pronotum thinly clothed with grayish-fulvous pubescence; head with front narrowly margined either side with condensed pubescence, and an irregular vitta, a small spot at base of antennal tubercles at isthmus of eye, and a narrow, oblique vitta below isthmus of fulvous-tinged white pubescence; pronotum with three dense white vittae, one at middle narrow, gradually widening to apex, one either side (a continuation of the lateral on head), oblique, broad and widest at base; entire surface with scattered, short, coarse, white hairs. Scutellum entirely white pubescent. Elytra thinly grayish-brown pubescent, with a narrow, white, common vitta at suture on basal third, and each elytron with four narrow, fulvous vittae broken into very small maculae, one nearer suture attaining only basal fifth and joined at elytral apex to the second which is oblique and attains the inner side of the humerus, third from middle to apex where it joins the extreme lateral vitta which nearly attains the humerus, entire surface with single white hairs in each puncture. Beneath reddish-brown, clothed with gray-brown pubescence, medially yellowish-gray pubescent, mesosternum, mesosternal side-pieces and metasternum with a lateral vitta of dense white tomentum, which becomes slightly narrowed on metasternum; sternites each side with two small, elongate, fulvous maculae. Legs reddish-brown, clothed with gray-brown pubescence and with single, scattered, white hairs; antennae reddish-brown thinly clothed with gray-brown pubescence.

Head above with a few coarse, shallow punctures; a median impressed line from occiput to near epistoma; front very elongate, distinctly narrowed above and feebly narrowed below the lower margin of eye, surface with shallow, coarse punctures; genae distinctly elongate, surface rugose, with coarse, scattered punctures; eye with lower lobe broad, trapezoidal, narrowed below, nearly one eighth longer than gena; antennal tubercles prominent, approximate, with a tooth on upper margin of mesal surface. Pronotum elongate, narrowed apically and basally, entire surface transversely rugose; sides unarmed, without trace of tubercle behind middle. Scutellum transverse, sides straight, oblique, apex very broadly rounded. Elytra with sides nearly straight to apices, which are each broadly rounded; basal fourth coarsely, rugosely-punctate, punctures coarse and dense to middle, thence to apex finer and less dense; humeri slightly prominent, angle simply rounded. Prosternum narrow, simply rounded, widened basally; metasternal process narrow, subtruncate at apex; fifth sternite slightly longer than fourth, at apex deeply emarginate. Legs short, robust; procoxae globose, flange moderate, an obtuse tubercle anteriorly; femora robust, clavate, profemora more strongly robust and rugose basally; metatibiae dilated apically; protarsi dilated. Antennae twice body length; scape rather robust, cylindrical, slightly wider apically; third segment straight, cylindrical, two-thirds as long as scape; fourth one sixth longer than scape; remaining segments gradually shorter, except eleventh which is three fourths longer than tenth.

Length 17 mm.; width 4.3 mm.

Holotype: ♂; prov. del. Sara, central Bolivia, 450 m., Nov. 1909; (J. Steinbach); [C.M.].

Pachypeza teres Pascoe (Plate I, Fig. 5)

Pachypeza teres Pascoe, Trans. Ent. Soc. Lond., 1888, p. 508.

The elytra each have 2 complete bright ochraceous discal vittae and one white one, in addition to a common sutural ochraceous one; the body form is very elongate and slender.

Male: Elongate-oblong, very slender, cylindrical; head and pronotum piceous, elytra dark reddish-brown. Head and pronotum with very sparse, short, fine, yellowish pubescence; head with eye posteriorly margined, sides and a narrow vitta each side of front, bright fulvous; pronotum with five narrow vittae of same color, one medially bifurcate from middle to base, two either side of middle, one below and one above lateral tubercle. Scutellum thinly yellow pubescent. Elytra with thin, fine pale yellowish-gray pubescence, and each with three bright fulvous vittae and one whitish vitta, placed as follows: the fulvous one narrow at suture, the second from humerus to apex, and one on lateral edge, these latter two wider, the single white vitta lies between the sutural and second fulvous vittae and it does not attain either the base or apex. Beneath medium reddish-brown, thinly clothed with fine yellowish-gray pubescence, meso- and metasternal side-pieces densely white tomentose. Legs reddish-brown, moderately clothed with yellowish-gray pubescence. Antennae reddish-brown, brown pubescent.

Head above finely alutaceous with a few coarse punctures on vertex; a medium impressed line from occiput to epistoma; front narrow, elongate, feebly narrowed above and below the lower margin of eye, surface finely densely punctate with coarse punctures interspersed; genae vertical, surface rugose; eye with lower lobe ovate, one half longer than gena; antennal tubercles basally subcontiguous, at apex slightly divergent, with a distinct, short, blunt tooth posteriorly on apical margin. Pronotum feebly elongate, widest behind middle, apex and base sub-equal; sides arcuate, with a feeble, obtuse tubercle near base; disk with a distinct deep basal sulcus which is curved medially, surface transversely rugose, the rugosities from middle to base are interrupted by an elongate, feebly elevated median tubercle. Scutellum strongly transverse, sides nearly straight, apex broadly rounded, feebly emarginate medially. Elytra with sides nearly straight, apices separately broadly rounded (nearly together rounded); disk at base coarsely, densely punctate, the punctures becoming a little finer but no less dense to apex; humeri slightly prominent, angle simply rounded. Prosternum simple; mesosternal process narrow, bilobedly emarginate at apex; fifth sternite deeply emarginate at apex. Legs short; procoxae globose, with an obtuse tubercle anteriorly, flange well developed; femora robust, clavate, profemora finely rugose basally and slightly more robust; metafemora and tibiae not strongly compressed as in others of this genus. Antennae from one and one half to one and two thirds times body length; scape cylindrical, very feebly widened apically; third segment straight, one half longer than scape, succeeding segments gradually shorter, except eleventh which is distinctly longer than tenth; fimbriate heavily on segments one to five, slightly on the other segments.

Length 12.2 mm.; width 2.7 mm.

Type locality: Brazil.

Distribution: Southeastern Brazil and Paraguay. Paraguay: 2 ♂; no locality data, 1885; (Dr. Drake); [A.N.S.P.].

Pachypeza septenaria Heller, Deutsch. Ent. Zeit. 1923, p. 421. This is described from Philippine Islands and is placed near to *Pachypeza trivitta* New. but probably should be in *Pothyne,* as is indicated by the elytral apex being obliquely truncate, and basal pronotal sulcus distinct. No other real generic characters are mentioned in the description but it is certainly not a member of the present tribe. Pascoe in Trans. Ent. Soc. Lond. 1888, p. 508, suggests likewise that *Pachypeza trivitta* should be in *Pothyne.*

PLATE I

Fig. 1. *Pachypeza pennicornis* Germar ♂ × 3.
Fig. 2. “ *marginata* Pascoe ♂ × 4.
Fig. 3. “ *phegea* Dillon and Dillon, spec. nov. ♂ × 4.
Fig. 4. “ *joda* Dillon and Dillon, spec. nov. ♂ × 4.
Fig. 5. “ *teres* Pascoe, ♂ × 6.
Fig. 6. *Helvina uncinata* Thomson ♂ × 3.2.
Fig. 7. “ *lanuginosa* Bates ♂ × 3.5.
Fig. 8. “ *lypera* Dillon and Dillon, spec. nov. ♂ × 4.

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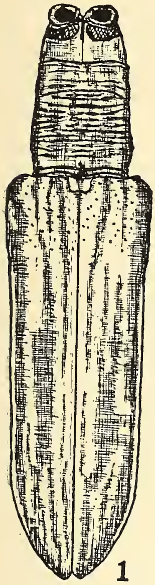
Plate I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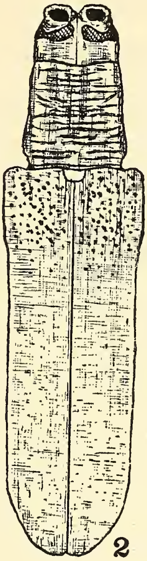
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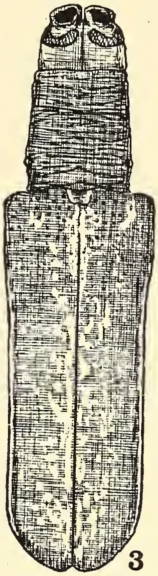
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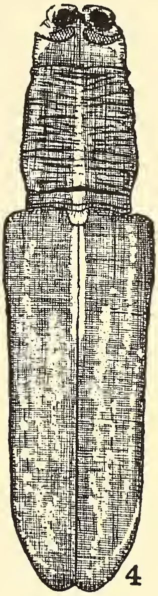
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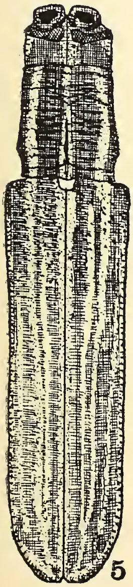
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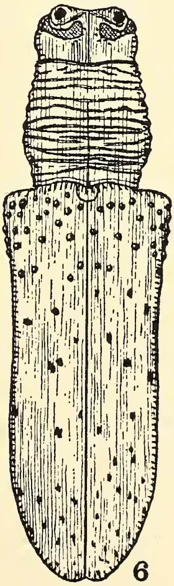
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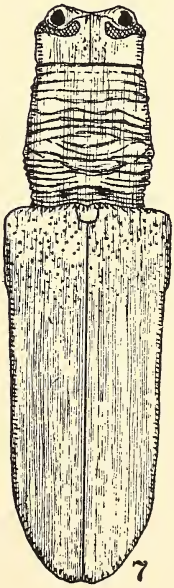
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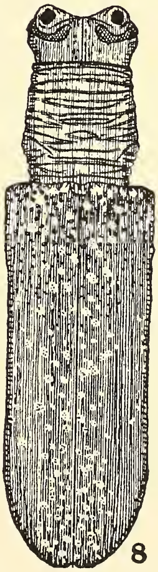
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WE MUST.

The constant purpose of the Brooklyn Entomological Society in its publications has been and is, to maintain high standards and to give subscribers to its journals as much as it can, compatible with its income from subscriptions. At all times our BULLETIN has been self-supporting; but in ENTOMOLOGICA AMERICANA our cost has been about twice our receipts. This excess has been overcome to some degree through the separate sale of its outstanding articles; even so, it is still a strain on the Society's resources. This publication is by design a restricted monographic journal, hence we cannot and do not expect a very large subscription list.

This is our problem: our printers have been compelled to increase their prices because of increased costs due to wartime conditions.

Immediately, this forces on us a compulsory choice: either we increase our subscription prices to meet the added cost; or we decrease the size of the journals to offset the raise. The Society has elected the second alternative, to its great regret. The present subscription prices will be continued for this year at least; but the number of pages of each Journal will be fewer.

With our dwindling subscription lists because of the war, it becomes imperative to be conservative. However, we would emphasize that an added 30 more subscriptions to either journal would make it possible to continue to give as many pages as we have up to this point. We will greatly appreciate all the help we can get from our subscribers and members to produce this growth.

Authors will be, and are here called upon to help us. To this end, we set these two strict limitations: first, papers with tabular matter of *any kind* will NOT be accepted, unless and only if the author is willing to meet the added cost of composition; second, NO plates or figures will be published, unless paid for by the author.

Our practice of giving authors 25 reprints of their articles gratis will be continued; but reprints will not be given *except on specific request.* We add one condition—no reprints will be given unless requested on the submission of the paper. On additional reprints above the 25 gratis, all our prices as of February, 1942, are hereby advanced 40%, as of the date of appearance of this February 1945 number of this BULLETIN. This increase is subject to revision without notice. In other respects, with all the changes above, the conditions are as of February, 1942.

We are deeply sorry to do all this, but needs must when the devil drives.

PUBLICATION COMMITTEE OF THE
BROOKLYN ENTOMOLOGICAL SOCIETY

THE CARNIVOROUS HABITS OF THE ADULT WASP, ODYNERUS DORSALIS FAB.

By Phil Rau, Kirkwood, Missouri.

It is a well-known fact that solitary wasps hunt insect prey for their offspring while they themselves feed upon the nectar of flowers. The temptation is often great, however, for the mother wasp while stinging and malaxating the prey to imbibe its juices sometimes, and we have records of certain Pompilid wasps that not only refresh themselves on the blood of the spiders which they hunt for their young but even catch and sting spiders for the sole purpose of gratifying this blood-thirsty habit, abandoning the carcass after it has been drained.

I have often seen *Odynerus dorsalis* feeding on the nectar of flowers, and I have often seen them transporting caterpillars of the species *Pholisora cattullus* to nests in the ground,[1] but the first record of seeing a mother catch and completely consume a caterpillar for her own food was at Reelfoot Lake, Tennessee, on July 12, 1937, when I saw a female *O. dorsalis* alight on a plant of lambsquarter, catch a *P. cattullus* caterpillar and malaxate it for twenty minutes. The brisk way in which she kept her palpi and jaws moving led me to believe that she was swallowing its blood.

This seemed to be the case, for after treating it in this way for another ten minutes, she threw it to the ground and flew away. I picked it up and found it to be an empty carcass sucked dry of its entire contents. It is interesting to note that she did not chew up the caterpillar but malaxated it sufficiently so that the contents could be sucked out easily. I have sometimes seen the workers of the social *Polistes* wasps feed on caterpillars that rightfully belonged to the larvae, but the flesh was made into pulp and rolled in the jaws for a long time before being swallowed.

There is a distinction between the terms "malaxate" and "masticate" and since writers are prone to confuse the two, it might be well to make clear the distinction here. To reduce the caterpillar to a semi-liquid without breaking the skin is to malaxate it, and to chew it into pulp, skin and all, is to masticate it. In the former case the food is drunk, and in the latter it is actually eaten.[2]

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[1] For a detailed account of the life history of *O. dorsalis,* see "Wasps Studies Afield," pp. 312–331, 1918.

[2] It is interesting, in this connection, to note that the Standard Dictionary defines the word "malaxate" "to knead to softness," and

A change of habit in feeding in the animal world is of much importance in the evolution of the species, and naturalists are beginning to give some thought to this subject. As a result we have some excellent papers, such as that by Brues, "Aberrant feeding behavior among insects" (Quarterly Review of Biology, 11: 305–319, 1936) and Myers on "Facultative blood-sucking in phytophagous Hemiptera" (Parasitology, 21: 472–479, 1929), which I should like to recommend to investigators seeking new problems.

An Unusual Occurrence of *Lynchia americana* (Leach) Diptera, Hippoboscidae).—Mr. Henry Dietrich, of the Department of Entomology, Cornell University, recently sent me a series of 61 specimens (39 females and 22 males) of the common *Lynchia americana*. These flies, as well as 7 specimens of *Ornithoica vicina* (Walker), were all taken from one great horned owl (*Bubo virginianus* Gmelin), trapped by Mr. C. E. Palm at Ellis Hollow, Ithaca, New York, August 28, 1944. It appears to be the largest number of specimens of this hippoboscid ever taken from one individual host. Moreover, the lot sent in was only part of the fly population of this owl, as many flies escaped from the dead bird; Mr. Palmer estimating that probably only one-half to two-thirds of them were captured. Many of the flies were moving about in the car that brought the bird to the laboratory and for several days afterward some were taken in the room, always sitting on the dark woodwork. Most of the parasites were collected by fumigating the bird for about an hour with carbon bisulphide and then shaking it very vigorously. The heavy infestation with these flies appears to have weakened the bird to such an extent that it was no longer able to hunt for its normal, wild prey. Instead it had taken to attacking domestic turkeys on a farm, which led to its being trapped. It may be noted on this occasion, that an earlier statement I published of 32 specimens of *L. americana* being taken on one great horned owl (1933, Psyche, XL, p. 75), was due to an oversight, as this record originally referred to the much smaller *Ornithoica vicina*.—J. Bequaert, Museum of Comparative Zoölogy, Cambridge, Mass.

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in the entomological sense as "the act of certain wasps in kneading insects to produce complete paralysis before putting them away for future use."

EDITORIAL.

Destruction!

The *A. A. A. S. Bulletin* for December carries a terrible story of the ravages of war. It tells of the vast destructions of books in Leipzig, The Book City of Europe, by aerial bombardment. The University Library alone contained more than one million books; the Deutsch Bücherei nearly two million. The great publishing houses, known the world over, are destroyed. All this was done in the vast effort to preserve civilization and culture.

To this day, men contemplate with astonishment and condemnation the destruction of the great Alexandrian Library by the Caliph Omar.

Entomology, as a minor and unconsidered subdivision of biology has not as yet had its losses counted. They must be incalculable. We know nothing about the fate of the great insect collections in France or in Belgium; at best, because of want of adequate staffs they must have deteriorated; they may even have been taken away. The British Museum has its specimens in a safe place, not mentioned for obvious reasons.

But consider the other parts of Europe. What has become of the great collections in Leningrad, a fought over mass of ruins? Where are the accumulations of the Polish National Museum in Warsaw, a city of the dead in heaps of rubble? What has been the fate of the Entomological Museum of Berlin, a metropolis levelled to the earth by a constant rain of aerial bombs? And if material was taken there from conquered cities, where is it now? As this is written, a bitter battle is being fought in Buda Pest, and streets and buildings are razed by artillery fire. What will be the fate of the Hungarian National Museum and of its great stores of specimens?

In these dreadful ruins, uncounted thousands of insect types are buried and gone forever. Thousands upon thousands of insects will never be known with certainty—the types are dust!

We are in this struggle to preserve the great edifice of civilization, but the very stones of which it has been built are ground into impalpable powder!

Cinis, pulvis, nihil! That is war, even a just war of defense!

J. R. T.-B.

BOOK NOTES.

Common Insects of Kansas, by Roger C. Smith, E. G. Kelly, Geo. A. Dean, H. R. Bryson, and R. L. Parker. 1943. Pp. 1/440, colored plates 1/6, and figures 1/464. Report of the Kansas State Board of Agriculture, Topeka, Kansas. (No price stated.)

The names of the writers of this excellent popular manual are enough in themselves to establish its reliability. Naturally, the book leans in the direction of economic entomology, because, as the Preface says, it is "the fourteenth number in a series of special reports, devoted to the agricultural interests of Kansas, each of which is a monograph of its subject matter." This is the basis on which it should be judged; and on this basis it is a fine production.

The report begins with a portrait and a brief sketch of the five authors, all entomologists of standing. The manual begins at the beginning, and tells briefly what are insects, how many species of them there are estimated to be in the world and how many of these species are in Kansas, these numbering some 16,000 in round figures. It discusses fossil insects and the habits of those living now. In fact, it covers adequately if briefly the general facts about insects. There are tabulated formulae for insecticides, which tell on what, how and when to use them, quite in detail. There are also sections on beekeeping and on how and where to collect and how to preserve specimens.

In the remaining three-quarters of the book, Dr. Smith treats some 900 insects phylogenetically according to orders. The numerous figures, mostly original, are good, some very fine indeed; and the six colored plates are excellent, plate 3 of Lepidoptera and 4 and 5 of Coleoptera are very beautiful. At the end is a brief glossary and the usual index.

In fact, as a whole, this work is an excellent brief introduction to entomology and it may be unhesitatingly recommended to begining entomologists.

This Report is a great credit to the State of Kansas which has published it, and to the competent men who planned it and wrote it.

J. R. T.-B.

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BULLETIN

OF THE

BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XL April, 1945 No. 2

UNDESCRIBED SPECIES OF TIPULA FROM WESTERN NORTH AMERICA (DIPTERA, TIPULIDAE).

By Charles P. Alexander, Massachusetts State College,
Amherst, Massachusetts.

Part I

In the present report I am describing two species of the genus *Tipula* Linnaeus from the Sierra Nevada, California. Both of these flies belong to the subgenus *Lunatipula* Edwards, now known to be represented by a host of species in the western Nearctic region. The materials here considered were taken by Dr. Otto Degener in the Sequoia National Park, and by Messrs. Thomas H. G. Aitken and Anthony Downes in and near the Yosemite National Park. I am very greatly indebted to the collectors for the privilege of retaining the type material in my very extensive series of Tipulidae.

Tipula (Lunatipula) sequoiarum n. sp.

Allied to *downesi*; general coloration of thorax gray, patterned with brown; antennae (male) relatively long, scape and pedicel yellow, flagellum black; knobs of halteres brownish black; femora obscure yellow, the tips narrowly and weakly infuscated; wings brownish gray, restrictedly patterned with dark brown and with very conspicuous whitish obliterative areas, including a nearly complete band before cord; male hypopygium with the caudal border of ninth tergite with a broad notch, the lateral angles of the lobes produced into acute spines; inner dististyle profoundly divided, the beak unusually slender; dorsal crest very high; outer basal lobe very large and powerful, appearing as a flattened arm, the apex of which is produced into an inner spine and outer curved spinous blade; eighth sternite produced at apex, the border shallowly

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emarginate to produce two strongly divergent lobes, the entire apex fringed with abundant long yellow setae.

Male: Length about 17 mm.; wing 17 mm.; antenna about 5.3 mm.

Frontal prolongation of head above obscure brownish yellow, sparsely pruinose, clearer yellow beneath; nasus short and stout; a concentration of black setae surrounding nasus; palpi with basal segment yellow, second segment infuscated above, more brightened beneath, outer segments black. Antennae with scape and pedicel light yellow; first flagellar segment brown, succeeding ones black; segments rather strongly incised; longest verticils subequal in length to the segments. Head brownish gray, more yellowed in front; a more or less distinct darker median vitta on vertex.

Pronotum obscure yellowish brown, more or less pruinose. Mesothorax of type badly crushed and not fully describable; praescutum gray, more yellowed laterally, the disk patterned with brown; scutum light gray, lobes variegated with darker; scutellum brownish yellow; postnotum dark brownish gray. Pleura variegated obscure yellow and gray. Halteres with stem obscure yellow, narrowly clear yellow basally, knob brownish black. Legs with coxae and trochanters yellow; femora obscure yellow, the tips narrowly and weakly infuscated; tibiae and basitarsi yellowish brown, the outer tarsal segments blackened; claws toothed. Wings with a strong brownish gray tinge, restrictedly variegated by dark brown and with conspicuous whitish obliterative areas; the dark markings include the stigma and restricted seams at origin of *Rs* and along cord; obliterative area before cord very conspicuous, almost reaching the posterior border at end of vein M_4; poststigmal brightening small, involving the bases of cells Sc_2 and R_2; prearcular and costal fields more yellowed; veins brown, brighter in the yellowed fields. Squamal setae abundant. Venation: *Rs* about two and one-half times *m–cu;* R_{1+2} entire; petiole of cell M_1 and *m* subequal; *m–cu* at fork of M_{3+4}.

Abdominal tergites obscure yellow, with a broad brown median stripe and much less evident sublateral ones, the latter most distinct on the proximal half of segment; all stripes more or less interrupted by pale caudal borders; sternites chiefly concealed by the overlapping tergites, yellow, the bases of the outer segments infuscated; hypopygium chiefly dark brown. Male hypopygium with the ninth tergite large, the caudal border with a deep median notch; lateral lobes broad and more sclerotized, their outer angles produced caudad into acute spines; dorso-median area of tergite entirely divided by pale membrane. Ninth sternite with the appendage short-oval, the blunt tip with a dense brush of long crinkly yellow setae. Basistyle entire, not produced. Outer dististyle elongate but very pale and inconspicuous, the longest setae about one-third the length of the style. Inner dististyle profoundly divided; anterior portion slender-stemmed, the outer end much expanded, including a slender reddish beak, a very small, triangular lower beak and an unusually high dorsal crest; on posterior margin of stem with a high narrow crest or flange, its outer edge microscopically crenulate; posterior portion of style, or the outer basal lobe, a very powerful flattened arm that is slightly widened outwardly, the inner apical angle produced into a slender straight spine, the outer apical angle extended into a much longer, curved, yellow spinoid blade; outer margin and apex of the arm with abundant long setae. Eighth sternite much as in *downesi,* sheathing, its apex produced and expanded into two lobes; caudal edge with a very broad V-shaped emargination that is densely fringed with long yellow setae that involve the entire outer margin of the lobes.

Habitat: California (Tulare County).

Holotype: ♂, Sequoia National Park, June 6–8, 1942 (*Degener*).

The most similar described species in *Tipula* (*Lunatipula*) *downesi* Alexander, which, while having the eighth sternite of the male hypopygium somewhat the same as in the present fly, differs very conspicuously in the structure of the tergite and the inner dististyle.

Tipula (Lunatipula) miwok n. sp.

Allied to *splendens*; size small (wing, male, under 13 mm.); general coloration yellow, the mesothorax dull; antennae with basal three segments yellow, remainder black; legs obscure yellow, the outer tarsal segments blackened; wings weakly tinged with brown, the prearcular and costal fields yellow; stigma brownish yellow; abdomen yellow, tergites two to six, inclusive, each with a large brown lateral spot; male hypopygium with the caudal margin of the ninth tergite irregularly toothed and spined; basistyle not produced into a spine; outer dististyle very small; inner dististyle with the beak pale, its tip broadly truncated.

Male: Length about 12–13 mm.; wing 11–12.5 mm.; antenna about 3.8–4 mm.

Frontal prolongation of head light yellow; nasus distinct, tufted with yellow setae; palpi with basal three segments yellow, terminal segment blackened. Antennae with scape, pedicel and most of the first flagellar segment yellow, the apex of the latter black; remainder of antennae black; flagellar segments moderately incised, the longest verticils unilaterally distributed, nearly as long as the segments. Head light gray, the anterior portion and the occiput more yellowed; posterior vertex with indications of a slightly darker median vitta.

Prothorax and mesothorax almost uniformly dull yellow, the ground with a very faint grayish bloom, the broad median praescutal stripe glabrous. Pleura with a sparse whitish bloom; dorsopleural membrane yellow. Halteres with stem yellow, knob dark brown. Legs with the coxae and trochanters yellow; remainder of legs obscure yellow, the outer tarsal segments blackened. Wings with a weak brownish tinge, the prearcular and costal fields light yellow; stigma a trifle more brownish yellow; obliterative band at cord poorly defined, indicated chiefly by the bullate nature of the veins, extending from before the stigma into the base of cell M_3; the immediate vicinity of the veins slightly more hyaline than the remainder of ground; veins brownish black, yellowed in the brightened fields, tip of vein *Sc* blackened. Venation: *Rs* nearly three times *m–cu;* R_{1+2} entire; *m* and petiole of cell M_1 subequal; cell M_4 not widened at *m–cu.*

Abdomen yellow, the tergites with five brown spots on the sublateral portions of segments two to six, inclusive, on tergite two near midlength of the sclerite, on the others close to the base, the last area small; median region of tergites at base with a less distinct darkened area; posterior borders of tergites pale; sternites and hypopygium yellow. Male hypopygium with the posterior border of ninth tergite irregularly lobed and toothed, including larger conical lateral lobes, each bearing a blackened tooth on face near apex; on either side of midline with a smaller lobe that is covered with microscopic setigerous tubercles and points, the most lateral one being a long slender spine near the base of the lobe; dorsomedian line of tergite with a furrow. Ninth sternite with the appendage strongly narrowed on its lower portion, the central area pale but setiferous; lower part of appendage with setae of unusual length, nearly as long as the entire lobe, those of the more dilated upper portion shorter. Basistyle not produced into a spine, as in *splendens,* merely with a low fleshy tubercle that is provided with a few long setae. Outer dististyle a tiny pale spatula. Inner dististyle with the beak broadly truncated at apex, not blackened; lower beak terminating some distance from the tip of the former, blackened, narrowly obtuse; dorsal crest low but provided with abundant reddish setae that are directed backward; no developed outer basal lobe. Eighth sternite sheathing, narrowed outwardly, the caudal margin very gently emarginate, without clearly defined lateral lobes, the entire margin fringed with conspicuous reddish yellow setae, those at the outer angles a trifle stouter but not spinoid; on the broad median section the setae form a dense subrectangular patch, the entire setiferous area being set off from the body of the sclerite by whitish membrane.

Habitat: California (Mariposa County).

Holotype: ♂, Yosemite, Mirror Lake, altitude 4000 feet, June 6, 1939 (*Downes*). *Paratopotypes:* 2 ♂♂; *paratypes,* 3 ♂♂, Mormon Bar, June 6, 1939 (*Downes*), June 6, 1940 (*Aitken*).

The name, *miwok,* is that of an Indian Nation of Penutian linguistic stock occupying the general region of the Yosemite. The fly is most similar to species such as *Tipula* (*Lunatipula*) *lamellata* Doane and *T.* (*L.*) *splendens* Doane, differing very conspicuously in the structure of the male hypopygium, especially of the tergite, basistyle and inner dististyle.

June 16

Synonymical Note on Ammoplanopterus (Hymenoptera, Sphecidae, Pemphredonini).—In 1940 Mochi proposed the genus *Ammoplanopterus* (Bull. Soc. Fouad I^er d'Ent., XXIV, p. 27) for a peculiar new species, *A. sinaiticus,* from Palestine. The excellent description and figures of Mochi show without measure of doubt that his *Ammoplanopterus* is synonymous with *Protostigmus,* erected in 1918 by Turner (Ann. & Mag. Nat. Hist. (9), I, p. 356) for the reception of the Algerian form *P. championi.* Mochi's species *sinaiticus* may, however, eventually prove to be discrete from *P. championi.*—V. S. L. PATE, Cornell University, Ithaca, N. Y.

ON TWO HOLARCTIC PEMPHILIDINE WASPS (HYMENOPTERA, SPHECIDAE).

By V. S. L. Pate, Cornell University, Ithaca, N. Y.

Several years ago I called attention to the fact that several of our common Nearctic wasps were identical with equally common European species.[1] Since then two interesting cases of a similar nature have come to my attention and are reported here. During the course of the past century and a half, each of these wasps has acquired a startling array of synonyms which are listed below along with the more recent bibliographic records of the species. For a complete bibliographic history of these species in Europe, Kohl's monograph of the Palaearctic Crabrones may be consulted.[2]

Ectemnius (*Ectemnius*) *dives* (Lepeletier et Brullé)

Solenius dives Lepeletier et Brullé, Ann. Soc. Ent. France, III, p. 716 (1835). [♂, ♀; Paris, France.]

Crabro alatulus Dahlbom, Exam. de Crabron. Scand., p. 85 (1840). [♂, ♀; Östergöthland, Sweden.]

? *Crabro pictipes* Herrich-Schaeffer, Faun. Insec. German. Fasc. 181, tab. 5 (1841).

Solenius 8-notatus Dahlbom, Hymen, Europ., I, p. 388 (1845). [♀; Habitat in Gallia.]

Crabro auratus F. Smith, Catal. Hymen. Brit. Mus., IV, p. 398 (1856). [New name for *Solenius dives* Lep. & Br.]

Crabro (*Ectemnius*) *pictus* Schenck, Jahrb. Ver. Naturk. Nassau, XII, p. 70 (1857). [♀.]

Crabro montanus Cresson, Proc. Ent. Soc. Phila., IV, p. 484 (1865). [*Nec* Gistl.] [♀; Mountain region, Colorado Territory; summer, 1864.]

Crabro cristatus Packard, Proc. Ent. Soc. Phila., VI, p. 101 (1866). [♂; Colorado Territory and Illinois.]

Crabro cubiceps Packard, Proc. Ent. Soc. Phila., VI, p. 105 (1866). [♀; Illinois; Brunswick, Maine, on *Spiraea alba.*]

Crabro montanus Fox, Trans. Amer. Ent. Soc., XXII, p. 139 (1895). [♀, ♂; Canada to N. Y.; Ill.; Mich.; S. Dak.; Colo.; Nev.; Ore.; Wash.]

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[1] Bull. Brooklyn Ent. Soc., XXXVIII, pp. 14-16 (1943).

[2] Ann. k. k. Naturhist. Hofmus. Wien, XXIX, pp. 1-453 (1915).

Crabro montanus Kincaid, Ent. News, XI, p. 355 (1900). [♀, ♂; Washington: various localities.]

Crabro dives Schencki Cockerell, The Entomologist, XL, p. 51 (1908). [New name for *Crabro pictus* Schenck, 1857 *nec* Fabricius, 1793.]

Crabro (*Ectemnius*) *montanus* Viereck, [in Smith] Ann. Rept. New Jersey St. Mus., 1909, p. 681 (1910). [Probably in New Jersey.]

Crabro (*Crabro Ectemnius*) *dives* Kohl, Ann. k. k. Naturh. Hofmus. Wien, XXIX, p. 94, 379 (1915). [♀, ♂; complete synonymy, bibliographic history and range in Palaearctic region.]

Solenius (*Ectemnius*) *montanus* Rohwer, Conn. Geol. & Nat. Hist. Surv. Bull. 22, p. 666 (1916).

Crabro montivagans Strand, Arch. Naturg., LXXXII, p. 98 (1917). [New name for *Crabro montanus* Cresson *nec* Gistl.]

Solenius cristatus Cockerell, Ent. News, XXX, p. 114 (1919). [Correct name for *Crabro montanus* Cresson *nec* Gistl.]

Cr[*abro*] (*Ectemnius*) *dives* Berland, Faune de France, X, p. 196 (1925). [♀, ♂; all of France; nests in holes in the branches of trees; preys upon Diptera.]

Crabro montanus Carter, Canad. Entom., LVII, p. 131 (1925). [♂, ♀; Edmonton, Alberta.]

Ectemnius montanus Johnson, Biol. Surv. Mt. Desert Reg., Pt. I: Insect., p. 157 (1927). [Mt. Desert I., Maine.]

Solenius (*Solenius*) *montanus* Bradley, [in Leonard] Cornell U. Agr. Expt. Sta. Mem. 101, p. 1019 (1928). [New York: Ithaca reg.; nests in logs.]

Crabro (*Solenius*) *dives* Gussakovsky, Ark. Zool. (Stockholm), XXIV, no. 10, p. 16 (1932). [♀, ♂; Ussuri, Manchuria: Sedanka. Sutshan.]

Crabro (*Ectemnius*) *dives* Nixon, Ent. Month. Mag., LXXI, p. 57 (1935). [♂, ♀; Tulse Hill, s. e. London; nesting in telegraph pole.]

The North American species which has hitherto been known as *Crabro montanus* Cresson (*nec* Gistl) or *C. cristatus* Packard is identical with the European *Ectemnius dives* (Lep. & Br.). Nearctic specimens of the species compared with European material determined by Kohl as *dives* agree in all essential respects. The species exhibits a certain amount of variation in livery and sculpturing, and in the spination of the male fore tarsi in both Europe and North America, but none of these variations appear to be localized or of sufficient importance to warrant the division of the species at the present state of our knowledge into geographical races.

In North America *dives* is common and widespread from the Atlantic to the Pacific coasts in the Canadian provinces and the northern United States. I have seen specimens from Maine, Massachusetts, New York, New Jersey, Pennsylvania, Illinois, Ohio, Michigan, South Dakota, Colorado, Nevada, California, Oregon, Washington, British Columbia, Alberta, Ontario and Quebec. It has also been reported from Vermont, Connecticut and Wisconsin.

In the Palaearctic Region *dives* is equally common and widespread, ranging from Spain and the British Isles to the Amur region of eastern Siberia and the Ussuri in eastern Manchuria and from Algeria northward to Scandinavia. The common and widespread occurrence of this species throughout the United States and Canada, and particularly its presence in the mountain region of Colorado as early as 1864, coupled with the fact that it inhabits eastern Siberia, indicates that in all probability *dives* immigrated into North America via the Siberian-Alaskan land bridge in preglacial times, during some interglacial period, or at a postglacial optimum.

Despite its commonness in America, very little is known of the ethology of *dives.* Rau states[3] that Barth found *dives* (recorded as *montanus* Cress.) nesting in an old log (probably in the vicinity of Milwaukee, Wisc.) in company with *Ectemnius obscurus, E. chrysargyrus,* and *E. sayi.* A similar paucity of information exists in Europe about the species. Kohl, in his monograph of the Palaearctic Crabrones, states[4] that *dives* nests in decayed or rotten logs and also in the stems of hornbeam, roses and elders and the canes of *Ribes;* and that the adults frequent the flowers of common umbellifers. Sickmann[5] has found that *dives* nests in old stems and provisions its cells with flies; while Nixon has recently recorded[6] it as emerging from holes in a telegraph pole at Tulse Hill in southeastern London.

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[3] Rau: Wasp studies Afield, p. 96 (1918).

[4] Kohl: Ann. k. k. Naturhist. Hofmus. Wien, XXIX, p. 379 (1915).

[5] Sickmann: Jahrsber. Naturwiss. Ver. Osnabruck, IX, p. 58 (1893).

[6] Nixon: Ent. Monthly Mag., LXXI, p. 57 (1935).

Ectemnius (*Metacrabo*) *4-cinctus* (Fabricius)

Crabro 4-cinctus Fabricius, Mantissa Insect., I, p. 295 (1787). [Habitat Hafniae.]

Crabro cephalotes Olivier, Encycl. Méthod. Insect., VI, p. 513 (1791). [Environs de Paris.]

Crabro striatus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 707 (1835). [♀, ♂; Environs de Paris.]

Crabro ornatus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 709 (1835). [♀; Environs de Paris.]

Blepharipus striatulus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 737 (1835). [♂; Environs de Paris.]

Ceratocolus striatus Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 744 (1835). [♂; Environs de Paris.]

Ceratocolus fasciatus var. 1, Lepeletier & Brullé, Ann. Soc. Ent. France, III, p. 746 (1835). [♂; Environs de Bordeaux.]

Crabro Lindenius Shuckard, Essay Indig. Foss. Hymen., p. 143 (1837). [♀, ♂; England: London. Ripley in Surrey.]

Crabro Shuckardi Dahlbom, Exam. de Crabron. Scand., p. 98 (1840). [♂, ♀; Östergöthland, Sweden.]

Crabro interruptus Dahlbom, Hymen. Europ., I, p. 418 (1845). [♂, ♀; widespread throughout Europe.] [New name for *Crabro Shuckardi* Dahlbom, 1840.]

Crabro Fargei F. Smith, Catal. Hymen. Brit. Mus., IV, p. 410 (1856). [New name for *Ceratocolus striatus* Lepeletier & Brullé, 1835.]

? *Crabro frigidus* F. Smith, Catal. Hymen. Brit. Mus., IV, p. 419 (1856). [♀; North America.]

Crabro aciculatus Provancher, Natural. Canad., XIII, p. 108 (1882). [♀, ♂; Canada, Quebec: Cap Rouge and Chicoutimi.]

Crabro (*Solenius*) *ruthenicus* F. Morawitz, Hor. Soc. Ent. Ross., XXVI, p. 174 (1892). [♀; Ostachov in Tver, Russia.]

Crabro aciculatus Fox, Trans. Amer. Ent. Soc., XXII, p. 160 (1895). [♀; Canada; Illinois.]

Crabro (*Crabro*) *quadricinctus* Kohl, Ann. k. k. Naturhist. Hofmus. Wien, XXIX, pp. 42, 358 (1915). [♀, ♂; complete synonymy, range, and resumée of biology in Palaearctic region.]

Crabro aciculatus Gahan & Rohwer, Canad. Entom., XLIX, p. 391 (1917). ["Type.—Female, yellow label 813. 2 Coll.

Publ. Mus., Quebec. Male, allotype, without label."]

Metacrabro quadricinctus Spooner, Journ. Soc. Brit. Ent., I, pp. 48-53 (1934). [Biology of a colony: Dartmoor, near Plympton, S. Devon.]

Metacrabo quadricincta Richards, Proc. R. Ent. Soc. London, (B) Tax., V, p. 171 (1936). [Type of *4-cinctus* Fabricius = *zonatus* Panzer *sensu* Kohl, 1915.]

Solenius aciculatus Krombein, Bull. Brooklyn Ent. Soc., XXXIV, p. 143 (1939). [New York: various localities.]

The large and handsome Nearctic form *Crabro aciculatus* is relatively rare in collections and has been generally unrecognized ever since Provancher described it in 1882 from Lower Canada. Of late years the species has become rather common in the region about Ithaca, N. Y., and I have seen additional specimens of it from Illinois, Pennsylvania (Swarthmore), Connecticut (Cornwall), and various localities in Quebec (Joliette, Montreal, etc.). These specimens, however, agree perfectly with Kohl's description and figures of *Crabro quadricinctus* [Fabricius], as well as European material determined as such by him. Consequently, *Crabro aciculatus* Provancher, 1882 must be recorded as a synonym of *C. 4-cinctus* Fabricius, 1787 *sensu* Kohl, 1915. Richards has recently stated, upon the authority of Dr. K. L. Henriksen, that the presumed type of *C. 4-cinctus* F., in the Lund Collection at Copenhagen, is *C. zonatus* Panzer *sensu* Kohl (despite Kohl's denying it) and that another specimen labelled (by Fabricius or Lund) "Varietas" agrees with Kohl's interpretation of *C. 4-cinctus* F. In view of all the facts of the case, I am inclined to agree with Drs. Richards and Henriksen that some error, a switch of labels perhaps, has occurred in the past century and a half and advocate that the name *Crabro 4-cinctus* Fabricius *sensu* Kohl should continue to be applied to this species.

In Europe *4-cinctus* is a common and widespread form, ranging from England to southern and eastern Russia and from Sicily to as far north as the 61° of latitude in Scandinavia. In this hemisphere *4-cinctus* is apparently confined as yet to northeastern America, and I believe that, like *Ancistrocerus parietum* and other Aculeate Hymenoptera which nest in wood, *4-cinctus* is a relatively recent accidental introduction.

Although nothing has been recorded of the habits of *4-cinctus* in America, there are many accounts of its life-history in European literature. These data have been summarized by Kohl in his monograph of the Palaearctic Crabrones, and Hamm and Richards, and

Spooner have presented admirable accounts of its biology in Britain. These wasps generally nest in colonies: they construct their burrows in either firm or decayed oak trunks or posts and their excavations usually produce large piles of wood dust. The burrow consists of a main tunnel from which branch off small lateral galleries containing one or more cells in a linear series. The main tunnel of the nest is apparently communal, for both Spooner, and Hamm and Richards have observed numerous females entering the same nesting hole. Each female, however, probably excavates her own lateral galleries and provisions her own cells. Quite an assortment of Diptera of various families (Calliphoridae, Sarcophagidae, Anthomyiidae, Cordyluridae, Helomyzidae, Sapromyzidae, Syrphidae, Tabanidae and Leptidae) form the prey of *4-cinctus,* but in all likelihood each female provisions any one cell with only one or perhaps a few species of flies.

Rabbitbrush Aphid Notes.—An accidental alate *Amphorophora sonchi* Oest. was taken on *Chrysothamnus nauseosus* at Wells, Nevada, Aug. 20, 1943. *Aphis chrysothamni* Wilson was collected from *Chrysothamnus nauseosus* at Helena, Montana, Aug. 3; Bend, Sisters and Tumalo, Oregon, Aug. 24, 1944; Twin Falls, Idaho, August 13, 1943; Wells, Nevada, August 20, 1943; Richmond and Lewiston, Utah, Sept. 8, 1938. *Aphis gregalis* Knlt., on *C. vaseyi* at Widtsoe, Utah, Sept. 19, 1935; on *C. viscidiflorus* var. *typicus,* Granite, Utah, June 6, 1931; *C. viscidiflorus* at Hubbard Ranch and Snowwater Lake, Nevada, Aug. 20, 1943; also taken at Rexburg and Riverdale, Idaho (C. F. Smith). A *Capitophorus gregarius* Knlt. on *C. nauseosus* in Logan Canyon, Utah, Oct. 8, was being fed on by a 2-spotted lady-bird beetle; this aphid was also collected at Mt. Nebo, Utah, July 12, 1942. *Capitophorus oestlundi* Knlt. collected on *Chrysothamnus nauseosus* at Ft. George Wright, Washington, August 9, Berns, Oregon, August 24, and Helena, Montana, August 3, 1944. *Macrosiphum escalantii* (Knlt.) on *Chrysothamnus viscidiflorus,* Sisters, Oregon, Aug. 24, 1944; on *C. nauseosus* at Wells, Nevada, Aug. 20, 1943; Alpine, Wyoming, Sept. 11, 1941. *Durocapillata utahensis* Knlt. on *C. viscidiflorus* at Snowwater Lake, Nevada, August 20, 1943.—G. F. KNOWLTON, Utah Agricultural Experiment Station, Logan, Utah.

ROBBER FLY AND JAPANESE BEETLE.

By S. W. Bromley, Stamford, Conn.

The first Japanese beetle (*Popillia japonica* Newn.) in Connecticut was found at Stamford in 1926. Due to the extensive buffer areas of woods and brushland lying between the Sound and the grounds of the Bartlett Tree Research Laboratories eight miles north, it took ten years for the beetle to reach the latter point.

The Japanese beetle was first found on the Bartlett grounds in 1936 and it seems probable that the invasion route was along the newly opened Merritt Parkway from the southwest rather than from the infestation in the city of Stamford. Japanese beetle traps were immediately placed in operation on the laboratory grounds with the following numbers of beetles trapped annually: 1936, 34 *Popilia japonica;* 1937, approximately 300 *P. japonica;* 1938, approximately 30,000 *P. japonica;* 1939, trapping discontinued as it was evident that trapping failed to exert any appreciable degree of control. The traps were simply attracting flying beetles to the area and increasing the infestation because of the great number of egg-laying females escaping capture.

The beetle population increased in a rapidly rising crescendo until 1943, the peak year. In 1944, due to a variety of causes (chief among them, the unprecedented drought) the beetle population showed a marked decline, falling back to the approximate level of 1940.

The heavy concentration of Japanese beetles in this area was turned to good advantage. Their numbers made extensive spray tests possible which resulted in the discovery of new and better insecticides. To maintain a beetle population suitable for these spray tests, no grub-proofing with arsenate of lead—which is the only control measure resulting in a wholesale kill of this pest—was practiced, although on June 3, 1941, a small portion of the lawn was treated with milky-disease as an experiment.

Large numbers of the beetle grubs in the lawns had, however, been dug out and eaten by birds, principally starlings and crows, while an even greater number were accounted for by skunks.

The adult beetles enjoyed an immunity not accorded the grubs by birds and mammals, the only bird noted killing the adult beetles being the crow.

A very interesting insect enemy of the adult beetle, however, appeared in the form of a large Robber Fly—one of the bumble-bee mimics, *Bombomima grossa* Fabr., our largest New England Asilid.

This fly was first observed feeding on the Japanese beetle on July 31, 1940, and the following records were obtained of subsequent captures. Inasmuch as female Asilids are likely to be more predacious than the males, the sex of the fly captor was recorded. However, more males than females were taken feeding on the Japanese beetle.

1. Sex of fly, male. Stamford, Conn. July 31, 1940.
2. Sex of fly, male. Stamford, Conn. August 5, 1940.
3. Sex of fly, undet. Stamford, Conn. August 21, 1940.
4. Sex of fly, undet. Stamford, Conn. August 21, 1940.
5. Sex of fly, male. Stamford, Conn. July 13, 1941.
6. Sex of fly, male. Stamford, Conn. July 23, 1941.
7. Sex of fly, female. Weston, Conn. July 26, 1941.
8. Sex of fly, male. Weston, Conn. July 27, 1941.
9. Sex of fly, female. Stamford, Conn. August 2, 1942.

It might be of interest to record other prey data of this bumblebee-like Robber Fly, which I have collected over a period of years. These are as follows:

COLEOPTERA: The beetle, *Anomala lucicola* Fabr. Sex of fly, female. Astoria, Long Island, N. Y., July 3, 1927 (S. W. B.). The carrion beetle, *Silpha americana* L. Sex of fly, female. Poundridge, N. Y., July 25, 1936 (S. W. B.). The Cetoniid beetle, *Euphoria fulgida* Fabr. Sex of fly, male. Weston, Conn., July 6, 1941. The Carrion beetle, *Silpha americana* L. Sex of fly, female. Milton, Mass., August 14, 1922 (G. W. Barber). The Carrion beetle, *Silpha americana* L. Sex of fly, female. Sturbridge, Mass., July 17, 1911 (S. W. B.). The rove beetle, *Staphylinus vulpinus* Nordm. Sex of fly, female. Southbridge, Mass., August 12, 1915 (S. W. B.). The rove beetle, *Staphylinus maculosus* Grav. Sex of fly, female. Ramsey, N. J., August 4, 1917. (Collected by Dr. F. E. Lutz; on exhibit in American Museum of Natural History in lot of insects collected by Dr. Lutz in his back yard.) An Oedomerid beetle, further unidentified. Sex of fly, male. Burlington, Mass., June 26, 1923 (G. W. Barber). The *Cerambycid* beetle, *Judolia cordifera* Oliv. Sex of fly, male, Concord, Mass., July 27, 1924 (G. W. Barber). The Scaraboeid beetle, *Serica trociformis* Burm. Sex of fly, male. Chicopee, Mass. (collected by F. Knab, in collection of Massachusetts State College). The Rose chafer, *Macrodactylus subspinosus* Fabr. Sex of fly, male (J. Bequaert). The clover-leaf weevil, *Hypera punctata* Fabr. District of Columbia. (Recorded by McAtee and Banks: Proceedings of the Entomological Society of Washington, Feb. 1920, vol. 22. No. 2, p. 25.) The flower beetle, *Trichius* sp. Poundridge, N. Y., July 20, 1935. Sex of fly, male (S. W. B.). The flower beetle, *Trichius* sp., Poundridge, N. Y., July 27, 1935. Sex of fly, female (S. W. B.). The Carrion beetle, *Silpha americana* L. Sex of fly, male. Poundridge, N. Y., July 27, 1935 (S. W. B.). The Carrion beetle, *Silpha americana* L. Sex of fly, female. Poundridge, N. Y., July 25, 1936 (S. W. B.).

HYMENOPTERA: The honey-bee worker, *Apis mellifica* L. Woburn, Mass., August 14, 1922. Sex of fly, female (G. W. Barber). The worker bumble-bee, *Bombus vagans* Smith. Woodstock, Conn., August 15, 1918. Sex of fly, male (S. W. B.). Bumblebee worker, Inglenook, Pa., July, 1927 (A. B. Champlain). The bumble-bees, *Bombus fervidus* and *B. perplexus*. Boston, Mass., July 23, 1924, and August 3, 1927. Sex of flies, both female. (Recorded by O. E. Plath.)

LEPIDOPTERA: In "The Gypsy Moth" by Forbush and Fernald, 1896, p. 392, it was recorded that "Of the predaceous Diptera, the following species have been taken feeding upon the imagoes of the gypsy moth: *Dasyllis sacrator* Walk., attacking the females while laying;" What was evidently one of the specimens on which this observation was based is in the collection of the Massachusetts State College, bearing Williston's erroneous identification as *Dasyllis sacrator* Walker and the label, evidently Mosher's, "feeding on female moth," Woburn, Mass., July 7, 1895.

HEMIPTERA: The Cicada, *Tibicen sayii* S. & G., recorded by Champlain and Knull, Entomological News, 34, July 1923, p. 212.

It seems quite evident from this compilation that beetles are the preferred prey of *Bombomima grossa.* Interestingly enough, there appear the following insects of economic importance among the prey in addition to the Japanese beetle, the clover-leaf weevil, the rose chafer, and the gypsy moth.

Noteworthy in this connection appears to be the increase of this fly in Southwestern Connecticut with the rise of the Japanese beetle population. I had always considered this *Bombomima* a rarity, having seen only one specimen in Stamford during the three years 1929, 1930 and 1931. By 1940, four years after the Japanese beetle reached the laboratory grounds, it was not unusual to see as many as 4 or 5 of these big flies in the space of a few minutes' time near the various woodpiles along the margin of the woods or in the orchard and gardens, from late June through August, and to observe their aggressive actions against the Japanese beetle.

I have records of other large robber flies feeding on the Japanese beetle in other localities, but the only Asilid I have seen capturing *Popillia* in Stamford is *B. grossa.* On July 26, 1931, I took *Proctacanthus nigriventris* Macquart, which occurs only in the white sand country along the coast from Alabama and Florida north to Long Island, with a Japanese beetle as prey in the blueberry barrens of Bullock, New Jersey. On August 14, 1943, I took *Proctacanthus philadelphicus* Macquart, an erstwhile denizen of dry fields and pastures from New York and New England south in the mountains to Georgia, feeding on a Japanese beetle at Salem, New York.

P. philadelphicus formerly occurred on the grassy areas of the higher portions of our laboratory grounds, but strangely enough it began to disappear about the time that the Japanese beetle grub population became abundant. I have no explanation for this phenomenon, but the figures on the numbers of these flies noted at North Stamford over a period of successive years speak for themselves.

1935, 45 *P. phil.* noted: 1936, 36: 1937, 29: 1938, 27: 1939, 4: 1940, 2: 1941, 0: 1942, 11: 1943, 0: 1944, 0.

Ataenius darlingtoni Hinton a Synonym of A. salutator Fall.—Specimens of an Ataenius compared with the type of *Ataenius salutator* Fall (Journal of New York Ent. Soc., 1930, pp. 99, Vol. XXXVIII) and with a paratype of *Ataenius darlingtoni* Hinton (Annals and Magazine of Natural History, 1937, p. 179, Vol. XX) are identical with both. *A. darlingtoni* was described from Porto Rico, Santa Domingo and Jamaica. Dr. Chapin (Proc. U. S. N. M., 1940, p. 30) records other West Indian specimens from Hispaniola, Cuba, St. Croix, Antigua, Guadeloupe, and Grenada. *A. salutator* was described from Pensacola, Florida. I have examined specimens from Alexandria, La.; Biloxi, McComb, Jackson, Ocean Springs, and Lucedale, Miss.; Mobile and Auburn, Ala.; Columbus, Ga.; Pritchardville, Yemassee, and Blackville, South Carolina. *A. salutator* Fall may be separated from other U. S. *Ataenius* by a combination of three characters: crenate fimbriate lateral thoracic margin, finely densely punctate ninth elytral interval, and the posterior tibial fringe invariably of a group of four fimbriae.—O. L. Cartwright, South Carolina Exp. Sta., Clemson, S. C.

BEHAVIOR OF THAUMATOMYIA (= CHLOROPISCA) SPECIES (DIPTERA, CHLOROPIDAE).

By George Steyskal, Detroit, Michigan.

Thaumatomyia (= *Chloropisca*) *glabra* var. *bistriata* Wlk.—This fly was seen on sugar maple leaves in small colonies of six to twelve individuals on August 13 and 20, 1944, in Detroit, Michigan. The males would walk about fluttering their wings and swelling their terminal vesicles, dull-textured, semi-football-shaped organs at each side of the tip of the abdomen. On approaching another individual (? male) they would grapple with each other with their fore legs, rise up to an angle of 45°, and sometimes one of them would be overturned, pushed over the edge of the leaf, and finally fly away, not, however, without often coming back to renew the fray. The flies were very tame and one could get them to within a few inches of one's eyes without frightening them and even hold the leaf to keep it still.

No pairs were seen beginning copulation, but a few pairs were noticed retired to the branches. One pair remained *in copulo* for at least fifteen minutes.

One colony was seen on the same few leaves for at least two weeks. Small groups were also observed on leaves of box elder (*Acer negundo*) in Lapeer County, Michigan, on September 2, 1944, but they were inactive. No honeydew was seen in either instance.

Thaumatomyia parviceps Malloch.—On August 13, 1944, a group of *T. parviceps* was seen on one of the same trees on which *T. bistriata* was seen. These flies acted quite similarly to *T. bistriata* except that they would rise almost vertically on their hind legs, spar at each other with their fore legs, and sometimes fall into a "clinch" for a short time with their mouthparts apparently in contact.

No typical *T. glabra* Mg. were seen. *T. bistriata* specimens were fairly uniform and distinctly larger than the writer's series of *T. glabra,* which is taken frequently by sweeping low vegetation. In view of the above observations as well as the morphological uniformity of *T. bistriata,* the writer believes it desirable to consider it a distinct species.

INTERESTING PROBLEMS CONNECTED WITH THE CHECKERED WHITE BUTTERFLY PIERIS PROTODICE, BOISDUVAL AND LECONTE.

By George W. Rawson, Detroit, Michigan.

Although the life history, habits and peculiarities of many of our common North American butterflies are fairly well known, there are certain phases of the life of the so-called Checkered White Butterfly—*Pieris protodice*—that still remain a mystery.

This insect is sexually dimorphic, i.e., the sexes show marked differences of coloration and wing pattern, although the ground color of both sexes is white. In the male the upper surface of the hind wings is devoid of spots or other markings, but there are numerous black spots and streaks on the upper surface of the primaries or fore wings. The females are more heavily marked with larger spots, producing a checkered effect. It is this distinctive marking which gives the name, Checkered White, to the species. In addition to being sexually dimorphic, *protodice* varies in coloration with each succeeding generation. The first brood, which appears early in the spring, is quite heavily marked with greenish or greenish-gray bands along each side of the veins on the under surface of the hind wings in both sexes and is known as *vernalis.* The next generation loses a great deal of this coloration and in the summer brood the markings on the under surface of the hind wings of the males may be entirely lacking. In the late fall brood the coloration has a tendency to revert to the early spring form, but the coloration is never quite as dark.

Protodice is a native species with a range extending over most of North America. It is found from the Atlantic Ocean to the Rocky Mountains and from Southern Canada to Texas. Although it is considered to be more or less common over most of its range, several authorities are of the opinion that it is less common than formerly and the theory has been advanced that the Garden or Cabbage Butterfly, *Pieris rapae,* has in some way affected its normal abundance. If the Cabbage Butterfly has had this effect it may possibly be due to the simultaneous introduction of harmful parasites, for it is well known that many parasites, that have had time to adapt themselves to different hosts, have developed a balanced host-parasite relationship, a condition where both the parasite and its host have attained a biological balance or tolerance towards each other, so that, in most instances, there is no resultant damage. As a matter of fact good or well adapted parasites rarely cause any appreciable harm to their hosts, for by so doing they would destroy, or at least limit, the source of their existence. It must, however, be borne in mind that considerable time, possibly hundreds of years, is necessary to develop such a balance or tolerance. As a usual thing when a parasite transfers itself to a new host considerable damage may result, and it is, therefore, quite possible that the parasites introduced with the Cabbage Butterfly may have attacked *protodice,* which not having had time to develop this balance or tolerance may have been harmed sufficiently to account for the reputed reduction of its former numbers. Definite proof is, of course, necessary to support this theory.

Furthermore, *protodice,* like a number of other species of butterflies is subject to seasonal fluctuation in numbers. The reason for these fluctuations or irregularities is not well understood. During 1943, the specimen taken by one of our local collectors, namely Mr. Ralph Beebe of Ecorse, Michigan, is the only one of which I have any definite record. The writer's field notes (started in 1931) afford evidence of this seasonal fluctuation. In 1937 it was very common and during the latter part of 1940 and 1942 it was comparatively numerous. The unfavorable, wet spring that prevailed in this section of Michigan in 1943, may have been responsible for the local scarcity of the species and this circumstance is intimately connected with one of the problems given consideration in this article, namely: the survival of a species that has become reduced to a low status of abundance due to various causes. Let us, at this time, consider the life history of *protodice.* This species normally hibernates in the pupal stage, attached to weed stalks or other objects, in the characteristic position of the Pieris family—with the end of the tail firmly embedded in a button of silk and supported in a more or less horizontal position by a girdle of silk around the upper part of the body. In southern Michigan, the first generation hatches around the middle or latter part of April. The eggs develop into larvae which are alternately striped with golden yellow and greenish purple on the upper surface. The under surface is light green in color and there are a number of black dots on the body. The larvae feed on cabbage, turnip, mustard, and other Cruciferous plants and when full-grown change into light bluish-gray pupae. The *vernalis* form of *protodice* emerges around the middle or latter part of April dependent on the weather and as previously described, this generation is distinctly marked and is not easily confused with any other brood of *protodice.*

The spring form, *vernalis,* is, usually, not very abundant, at least not nearly so common as forms which occur later in the summer. The question now arises: In cases where *vernalis* becomes so rare, that its survival becomes extremely precarious, how does the species survive in localities where these influences prevail? It must be remembered that the early spring form, *vernalis,* is the foundation stock from which succeeding broods are produced. In other words, if the foundation or parent stock fails, how does the species continue to carry on? There are two theoretical explanations which seem logical—either the normal abundance of *protodice* is built up from survivors of the spring brood or the balance of numbers may be restored by the influx of migratory stock from outside the depleted territory. This question cannot be answered satisfactorily until we know more about the normal range of the flight of *protodice* but it would be interesting to take careful notes of the relative abundance of the various broods as they occur from year to year. Such observations may furnish clues to the method by which the normal balance in number is restored. The problems concerning migratory movements might be solved much sooner if only there were more trained observers available, since methods have now been devised to mark insects in a manner similar to the way in which birds are marked.

There are many other questions concerning *protodice* which are of interest to the lepidopterist. For instance, on October 8, 1939, the author, in company with Mr. Sherman Moore of Detroit, took about one dozen specimens on the Edwin S. George Reserve, near Pinckney, Livingston County, Michigan, that were so unusually marked as to cause considerable confusion as to their status. These specimens resembled the Western *Pieris occidentalis* very closely. By way of explanation, *occidentalis* is listed by Dr. J. McDunnough in his 1938 check list of "The Lepidoptera of Canada and the U. S. of America" as a distinct species. A careful examination of a series of typical *occidentalis,* from California and other Western states, shows that this race is very similar to the late fall specimens of *protodice* taken by Mr. Moore and the author on the George Reserve. For this reason they could be and probably are easily confused. There are, however, slight yet constant differences that enable a critical observer to separate the late fall brood of *protodice* from the western *occidentalis.* For instance, in typical male *occidentalis,* the triangular markings at the end of the veins at the edge of the outer margin on the upper surface of the fore wings are broader and more elongated and the apex in many specimens extends a little further toward the base of the wings than in *protodice.* Furthermore, the marginal row of spots running more or less parallel with the outer border of the primaries has a tendency to run together forming a bar in *occidentalis,* but rarely, if ever, in *protodice.* The under surface of the secondaries or hind wings, in either males or females does not differ to any appreciable extent in either typical *occidentalis,* or well marked specimens of the late fall brood of *protodice.* Nevertheless the coloration on the under surface of *occidentalis* is generally greener, and somewhat darker in shade than the average coloration seen in fall *protodice.* The reverse may be true in an occasional specimen. It is also advisable to note that the late form of *protodice* has been taken in other states than Michigan. The author's collection contains several well marked specimens from the District of Columbia and also one or two lighter marked specimens from Kansas. There seems to be no definite information available as to the range of this form of *protodice,* in fact, very few lepidopterists seem to have mentioned it.

Typical *protodice* occurs in the same territory as *occidentalis,* but the reverse is not true, that is, *occidentalis* is not found all over the territory where *protodice* ranges. In this connection, it should be noted that the status of *occidentalis* is controversial, a number of authorities are of the opinion that it is not a good species but is a western race of *protodice.* Dr. John A. Comstock in his book entitled "The Butterflies of California" regards *occidentalis* as a Western high altitude form of *protodice.* Most of the more recent writers hold the same opinion as Dr. Comstock. It might be well to mention here that the form *calyce* is considered to be a spring form of *occidentalis.* It, apparently, bears the same relationship to *occidentalis* as *vernalis* does to *protodice.* The markings on the upper surface of both wings are much heavier in *calyce* than in *vernalis,* in fact they can be very easily separated by any one who is familiar with the various forms and races of *protodice.*

There are other interesting facts concerning the late fall form of *protodice.* It occurs about the first week in October, providing weather conditions are favorable. This is of importance since rather severe frosts sometimes occur during the first week of October, and it is apparent that, at this time, it is too late in the season for the late broods of *protodice* to reproduce, other than by laying eggs, and this procedure is, to say the least, very questionable. As far as is known, there has been no report of *protodice* laying eggs in the late fall. It is generally believed that the species normally passes the winter in the pupal stage. Therefore, the question is: What happens to the last or late brood? Are they killed by the frosts which occur so frequently in this state during the month of October? In other words, do they die, as the lawyers say "without issue"? As we have no knowledge that *protodice* hibernates in the imago stage, it may be assumed that this late generation actually dies without leaving descendants. Possibly this is an example of a species over-reaching its capacity for normal or successful reproduction because of the lateness of the season. Information is lacking as to whether the late fall occidentaloid form occurs every year or whether it does so only when weather conditions are suitable. Perhaps the last generation, already in the pupal stage, which would ordinarily hibernate, may be induced to hatch because of ideal weather conditions, only to meet its fate because of insufficient time to produce another generation. If the pupae of the last generation prematurely hatch because of favorable weather, what becomes of the early spring generation that normally occurs in April? Possibly a sufficient number of the pupae do not hatch prematurely but are carried through the winter and hatch in the spring as they normally should. The unseasonable hatching of pupae in the fall may be an explanation as to why the early spring form, *vernalis,* is relatively uncommon, although this is probably only one of a number of reasons.

The last problem but not necessarily the least is how many broods or generations does *protodice* have in this State? Dr. J. H. Comstock in "How to Know the Butterflies" states that it is triple brooded. Macy and Shepard in "Butterflies North of the Potomac and Ohio Rivers and East of the Dakotas" state, "In the latitude of Minnesota the spring form appears in April and early May. The second generation in July and the third in September." William Field in "The Manual of Butterflies of Kansas" states that *protodice* has two forms, one in spring, another in summer, and that in October a form occurs intermediate between the spring and summer forms. This latter undoubtedly refers to the late fall form which the writer has previously mentioned. Mr. Austin H. Clark in "Butterflies of the District of Columbia" mentions three broods, the first in late April up to the first half of June and the second in July. This flies until the advent of the third brood towards the end of August. It would therefore appear to these authors that *protodice* normally has three broods during the season.

This paper may seem rather involved, but it is hoped that it will help to stimulate greater interest in problems that need to be solved and it also emphasizes the fact that there is a great deal more to the study of insects than the mere acquisitive act of making a collection.

In conclusion, a summary of the main principles of this article may bring them out in somewhat clearer detail.

1. The Checkered White Butterfly, *Pieris protodice,* is both sexually and seasonably dimorphic.

2. It is reputed to be less common than formerly, and one of the reasons for this is that the Common Cabbage Butterfly, *Pieris rapae,* is supposed to have interfered with its normal prevalence. Probably parasitism is one of the most likely explanations.

3. Like many other species of butterflies *protodice* fluctuates in abundance from season to season.

4. A theory is presented to explain the survival of the species when at a low ebb, possibly by the influx of migrants into depleted territory.

5. A late fall form of *protodice* is described that resembles the western form or race, *occidentalis.* This late fall form is considered by the author to be different from typical *occidentalis* and that the latter is not recognized, at least by some authorities as a separate species but as a western race of *protodice.*

6. Problems about the survival of the occidentaloid form of *protodice* are discussed in the belief that this particular form is one which hatches from pupae prematurely because of favorable weather only to be killed "without issue" by the early frosts.

7. The question is asked, "How many broods does *protodice* have in the State of Michigan?" We know too little about this and more definite information is greatly desired.

8. Hope is expressed that this article will create sufficient interest so that others will be stimulated in making further observations that will answer these questions.

A Mixed up Butterfly.—I have in my collection of Oregon butterflies a specimen of *Euphydryas colon* Edws. that might almost be called an aberrant aberration. The white spotting of the forewings on both the upper and under sides are elongated through their interspaces. These represent albifusism and the so-called transition form *fenderi* Gund. The white spotting on the upper sides of the hind wings is almost obliterated by the black areas. These represent melanifusism and the so-called transition form *mcdunnoughi* Gund. This specimen was collected at Elk Lake, Santiam Nat. Forest, Oregon, July 8, 1939, by Mrs. D. M. Fender. If such a freak is deserving of a name, I herewith propose the name of *Euphydryas colon* ab. **bakeri** after Mr. Jim Baker of Baker, Oregon.—Kenneth Fender, McMinnville, Oregon.

ON THE STATUS OF LIANCALUS LIMBATUS VAN DUZEE (DIPTERA–DOLICHOPODIDAE).

By F. C. Harmston and G. F. Knowlton, Utah Agricultural
Experiment Station, Logan, Utah.

Liancalus limbatus was described by Van Duzee in Entomological News, Vol. 28, page 127, 1917, from one male and a female which he collected at Berkeley, California. Apparently there was some question concerning the status of *limbatus* because Van Duzee stated, "This species is much like the European species *virens* Scopoli, but I think it is distinct." He indicated that no European material was at hand for comparison.

Having collected a series of *limbatus* at Yosemite National Park, Calif., in September, 1941, and having available for study a series of this species taken by Dr. M. T. James, at Capitola, Calif., in June, 1940, the writers have been prompted to compare these flies with a series of *virens,* from Germany, now deposited in the Utah Agricultural Experiment Station insect collection.

Males of the California specimens differ markedly from the European *virens* in the form and structure of the hypopygial lamellae and the wings. No satisfactory means have been found to distinguish females of the two species, one from the other, or from the females of the other four North American species of *Liancalus.*

The hypopygial lamellae of *limbatus* are ribbon-like and slightly longer than the fore tarsi; whereas the lamellae of *virens* are filiform and are hardly as long as the first joint of fore tarsi. The wing of *limbatus* has a broad, deep incision just behind the tip of fourth vein and another deep, but narrow, incision at the tip of fifth vein; the wing of *virens* is rather evenly rounded on posterior margin, without incisions of any kind. There can exist no doubt that *limbatus* is distinct from *virens,* and from all known members of the genus.

Flies of the genus *Liancalus* are among the largest and most interesting of the Dolichopodidae. In North America they are exceeded in size only by certain species of *Scellus.* Possessing long, graceful bodies, delicately tinted with brilliant hues of bronze and purple against a green background, few Diptera are more beautiful than the species of *Liancalus.* The beauty of some species is augmented by the presence of a gleaming, opalescent spot near the wing tip.

Of the five species known to occur in North America, only one, *genualis* Lw., has been taken east of the Mississippi River. They all occur in cool, shaded situations, generally near waterfalls or on moist or moss-covered rocks. The writers have taken *hydrophilus* Aldr., in the cool, dark boxcanyons which form a portion of Maple Canyon, Sanpete County, Utah. In that locality the flies were resting on the damp walls in the most heavily shaded parts of the canyon, sufficiently numerous that a dozen specimens could be taken in a single sweep of the insect net.

L. querulus O. S. have been taken in large numbers during late summer about masonry dams in the canyons near Logan and Ogden, Utah. *Similis* Aldr. were frequently collected near the waterfalls at Yosemite Park, Calif., along with the specimens of *limbatus* mentioned earlier.

"COCKROACH" VERSUS "ROACH."

In the June, 1944, Bulletin of the Brooklyn Entomological Society, Rau discusses the use of the terms roach or cockroach. R. W. C. Shelford, in "A Naturalist in Borneo," p. 114, refers to the American use of the term roach as follows:

"Americans have abbreviated this word as 'Roach,' perhaps by a reversed analogy with 'robin,' 'cockrobin.' As 'roach' is good Anglo-Saxon for a species of fish the use of the word for an insect is objectionable. 'Cockroach' is derived from the Spanish 'cucaracha,' a word of obscure etymology but possibly derived from some South American Indian word signifying this insect. 'Cuco' in Spanish means a sort of caterpillar or bug, and 'cucaracha' is possibly connected with this; if so the elision of the first syllable of 'cockroach,' the syllable which originally gave the word its significance, is doubly objectionable."

The word-taboo, to which Rau refers, is not characteristic alone of the Victorian age, but rather of the Anglo-Saxon and other Northern races, from whom America has inherited many of its manners and customs. Many such word-taboos are referred to by Vance Randolph in "The Ozarks, an American Survival of Primitive Society." Randolph tells us that the Hill Folk of the Ozarks have retained to a great extent, the language and customs of the Elizabethan period. I rather believe that dropping the prefix from the word cockroach is purely an Americanism, a custom of shortening words that has reached its climax in the present day alphabetical hodge-podge of governmental bureaus and one that is rapidly invading the realms of scientific literature.

Edwin P. Meiners.

REMARKS UPON SPATIAL RELATIONSHIPS IN ENTOMOLOGICAL DESCRIPTION.

By George Steyskal, Detroit, Michigan.

Anterior and Posterior vs. Cephalic and Caudal.

Of late years (since the publication of MacGillivray's External Insect Anatomy, 1923) there has been considerable use of the terms *cephalic* and *caudal* in a purely directional sense, that more often expressed by the terms *anterior* and *posterior*. It seems to the writer that something should be said against it. In the first place, as long as we know which end of an insect is forward, the old terms serve quite adequately. If there be any doubt as to which end is forward the matter can be settled better by definition than by the use of another term. From another viewpoint, the derivation from the Greek work for head (*kephalon*) and the Latin word for tail (*cauda*) produces a confusing association with these parts. Some authors refer to "cephalic femur," "caudal tibia," etc., as if there were legs attached to the head or tail, whatever the latter may be. When aphidologists refer to caudal structures they mean structures connected with a part of the abdomen that has for a long time borne the designation "cauda," and which is important taxonomically. Extrapolation of the meaning of the adverbial expressions formed with the suffix *-ad* (from Latin *ad*, meaning "to, toward, in the direction of") results for example in such expressions as "maxilla developed as a lobe extending far cephalad of the head." An author also writes of the "caudal end" of the fourth article of a posterior appendage; here "apical" or "distal" would be better, since the "caudal end" of an antennal article would be just the opposite.

Illustrative of the superfluity and dissatisfaction (conscious or otherwise) which authors find in the use of these terms is the lack of consistency in their application. The following examples, selected at random in a couple hours, will make the point plain.

a) In 1944 a description appeared wherein an appendage is said to be "inclined *cephalad* and mesad, the *anterior* margin slightly concave."

b) Another author describes an insect as having the vertex of the head "narrow at *caudo*mesal angle of eyes, expanded *anteriorly* and with an unusually broad strip extending *caudad* of eyes, *anterior* margin varyingly produced," etc., and in the next sentence "pronotum . . . broadened *posteriorly*." Would "caudally" in the latter instance mean "in the manner of a tail"?

c) A third author states in one paragraph "female last ventral segment with *posterior* margin . . . excavated" and "dorsal portion (of aedeagus) with process directed ventrally and *caudally*." The present writer in the latter case would prefer "posteroventrally."

d) A fourth author mentions "*anterior* side of femora," "*posterior* dorsocentral bristles," "*anterior* tarsus," and "*hind* basitarsus" but in the same paper has "male genitalia . . . strongly developed *cephalad* and *caudad*" and "*caudal* margins of (abdominal) segments."

The Plane of Bilateral Symmetry.

The choice of *medial, median, mid-, middle* and *mesal* in reference to the plane of bilateral symmetry seems to be a personal matter, although usage is predominantly in favor of "median" as an adjective and just as predominantly in favor of "medially" as the corresponding adverb. A few writers follow the dictionaries in using "medianly" as the adverbial form of "median." It would seem that the crux of the matter lies in recognizing "median" as referring only to the "median plane of symmetry," and using "medial" in other situations, as for example when referring to a band of color in the middle of a tibia as a "medial band" or when referring to the media vein of the wings, although in each case the term is derived from the same Latin word, *medius*.

Meson (Greek, neuter of *mesos* "middle") is a term which has the advantage of distinctness of form as well as providing a simple substantive (noun) for the concept of "plane of bilateral symmetry." From it are derived the adjective *mesal* and the combining form *meso-*. "Mid-line" or plain "middle" is also frequently used in the same sense, which would be all right were it not that a transverse band, carina, etc., could also lie in the middle of a part which is also bisected by the plane of symmetry, as a tergite. The middle one of the series of three thoracic somites and appendages, however, is also designated by the prefix *meso-* (mesothorax, mesonotum, mesotibia, mesepisternum, mesoleg (!), etc.).

Ectal, ectad, ecto- are sometimes used in referring to a direction away from the plane of symmetry, although *ecto-* is used in such well-known terms as ectoderm, ectoparasite, etc., in the sense of "outside." *Lateral* and *laterad* with the combining form *latero-* unambiguously refer to a direction away from the plane of symmetry.

A resume of the terms used for spatial relationships may be helpful:

Front, fore, foreward, before, ante-, anterior, antero-, pre-, pro-, cephalic, cephalo-.
Back, backward, hind, behind, after, rear, post-, posterior, postero-, re-, retro-, caudal, caudo-, meta-.
Top, up, upward, above, over, on, dorsal, dorso-, supra, super-, superior, hyper-, epi-, ana-.
Bottom, down, downward, under, below, infra-, inferior, sub-, ventral, ventro-, de-, hypo-, kata-, cata-.
Side, sideward, sidewise, beside, lateral, latero-, pleural, pleuro-, para- (see also Out).
Center, central, centro-.
Middle, mid-, medial, median, medio-, meson, mesal, meso-, mes-.
In, inward, inside, between, inter-, intra-, intro-, interior, in-, en-, endo-, ento-.
Out, outward, outside, away, extra-, extero-, extro-, exterior, ex-, e-, exo-, ectal, ecto-, ect-, ec-, apo-.
Base, basal, basi-, proximal, proximo-.
Tip, point, end, apex, apical, apico-, distal, disto-, telo-, acro-.
Across, through, trans-, per-.
Around, circum-, peri-.

A METHOD FOR PERMANENTLY REDUCING THE NUMBER OF BLOWFLIES IN SCREENED HOUSES.

By E. H. Strickland, University of Alberta, Edmonton, Canada.

Invaluable as are fly-screens for keeping many undesirable insect visitors out of houses, they are somewhat ineffective for the exclusion of Blowflies (Calliphoridae). Furthermore, they have the undesirable attribute of retaining in the house such of these flies as do gain access to it despite their presence on doors and windows.

Towards sundown, particularly when the nights are inclined to be cool, blowflies have the habit of squeezing themselves into surprisingly small cracks and crevices, such as those around the outer edges of fly-screens, around doors, through badly fitted eaves, &c. Owing to this habit many of them, ultimately, find their way into the house.

Sooner or later, however, their positive phototactic responses will bring all of them to the windows where, even though the latter are open, the screens prevent their escape. On their arrival on the screens it can now be seen that, in addition to their phototactic responses, they are definitely negatively geotactic when walking.

Their tendency, therefore, is always to walk up the screen even though they will fly in any direction. The combined effect of these responses is that all of them will be brought, at some time during the hours of daylight, to the upper edge of the screen, along which they walk horizontally, since this is the line of least resistance to their combined responses.

If, at one of the top corners of the screen, (either will do though, for a reason unknown to the writer, the right corner seems to be the best), a pencil be pushed through its meshes to make a small hole, every blowfly in the room will, sooner or later, be directed to it and will walk out, provided the window is partly open, above or below.

Since these flies, while in the open, are inactive at dusk, by which time the house lights may be of greater intensity than is that of the waning daylight, none are oriented to return to the house by the same route. Theoretically, it would seem that an occasional mosquito might gain access to the house by this means during the night though none has been observed to do so even when they are very numerous. In any event, a small cork could be employed during the mosquito season to "close the door" to them.

This method will not succeed at windows which are protected by awnings unless the latter are raised. With lowered awnings the phototactic responses of the flies prevent many of them from reaching the escape hole at the top of the screen.

Furthermore, the responses of houseflies are too complex to render this method very certain in driving them out of a house. They are definitely positively phototactic only to a marked difference in intensity of light and all can be brought to the window on a bright day by lowering the blind until only a crack of some two to three inches intervenes between it and the sill. Once they reach the screen, a slightly pronounced negative geotaxis may direct a percentage to the "open door," but many will fail to reach it.

For a number of years, several houses, which had suffered from serious infestations of blowflies, have been kept largely free from them by this simple expedient and it was employed last summer, with excellent results, to reduce a severe invasion of the buildings in a military camp.

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BIONOMIC NOTES ON MENECLES INSERTUS (SAY) (HEMIPTERA, PENTATOMIDAE).[1]

By W. V. Balduf, Urbana, Ill.

This comparatively little-known stink bug possesses two behavioristic features that are somewhat unusual in the Pentatomidae, namely its nocturnal activity and its migrations up and down tree trunks. Only fractional contributions toward a knowledge of its life cycle have been made. My notes add some personal observations and summarize briefly the bionomic data from the literature.

Menecles insertus was described as *Pentatoma inserta* by Thomas Say in 1831. The original description is reproduced in LeConte's The Complete Writings of Thomas Say on the Entomology of North America. Stål erected the genus *Menecles* in 1867 and transferred *insertus* to it: it is a monotypic group.

Nocturnal and Arboreal Behavior. Van Duzee (1904) obtained it in numbers from small hickory trees growing near Lewiston, New York. This seems to be the first published indication of its relation to trees. Since he mentioned neither stage nor time, I presume Van Duzee collected adults during the day, perhaps while they remained inactive under loose bark on the tree trunks. Hart mentioned the "arboreal habits" of *insertus* and reported it "very abundant . . . under a row of hard maple trees, which it was presumably leaving for hibernation." It is not entirely clear from these notes whether Hart or his collaborators had personally found the bug on trees. But Blatchley states definitely he had three individuals from the bole of a beech tree in a dense woodland near Indianapolis, and single ones "on the boles of trees, dead leaves, corded wood or some objects of dull hue with which the color blended."

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[1] Contribution No. 247 from the Entomological Laboratories of the University of Illinois. I am indebted to Doctor Charles O. Esselbaugh for permission to quote from his unpublished notes and for help with references to publications.

SEP 11 '45

The nocturnal studies made by Park and Strohecker in a forest in northern Indiana not only showed that *insertus* is active at night and inactive by day, but that its nightly movements are vertical and largely limited to living trees. They found it crawling from beneath the leaf mold at the bases of stump and tree and beginning their ascent by 9: 10 P.M. (probably C. S. T.). They appeared in great numbers throughout the night. By midnight they had moved from 8 to 15 feet or more up on the tree trunks and foliage, and by 3: 20 A.M. were moving down again. At 4: 23 they were on the average from six to eight feet above the forest floor, and at 5: 00 o'clock the majority had crawled once more under the mold and debris, while stragglers remained two to four feet up on the trunk.

That *insertus* is not continuously arboreal but spends the night on trees and the day under cover on or near the ground has been shown in the above statement modified from Park and Strohecker and by other observers. Stoner found 23 individuals under cover on the ground in wooded or semi-wooded districts at Iowa City. While Esselbaugh obtained specimens "in the open during broad daylight," he also found individuals under leaf mould.

On June 19, 1932, I discovered an aggregation of 95 individuals in a woods along the Salt Fork River south of Oakwood in Vermilion County, Illinois. It was full daylight and the bugs were concealed under the loose bark in its natural position on an old but still firm log lying on the ground near a number of living trees. The log measured about 10 feet long and 10 inches thick. All the 95 bugs captured were adults excepting one, which was a nymph in its last instar. Fifty of the adults were females, and 44 males. Near this site, I secured three females under leaves on April 12, 1936. Again, while collecting *Collembola* on the floor of Brownfield's Woods near Urbana on July 14, 1941, I sifted an adult and a mature nymph from dead leaves raked from the ground. These were secured near midday and several yards from trees or logs. In the same month, my attention was directed to a hackberry tree in this woods where a class in ecology had found numbers of this insect several days previously. On July 18, my daytime search among the dead leaves at the base of this tree revealed 27 adults and one mature nymph. All were inactive and hiding under the uppermost dead leaves that formed the cover of the woods floor; none had descended to the underlying soil. The majority occurred within four feet from the bole, and, with few exceptions they appeared west of the tree. Another adult was discovered at the base of an elm near the hackberry. Their color blends closely with that of old leaves, and they moved but slowly when disturbed.

Whether the vertical nocturnal movements alternate regularly and daily with a diurnal period of inactivity at the bases of trees, or these two phases of behavior occur at irregular intervals, has not been made known. It also has not been pointed out or observed whether the nymphs participate in this alternating vertical day–night activity.

Food. The above suggestion that *insertus* remains inactive under debris on the ground during the day implies, correctly or erroneously, that it feeds during the night while on the boles, branches or leaves of standing living trees. However, Kirkland included this bug among a number of Hemiptera that prey, presumably on the larvae, of the gypsy moth, *Porthetria dispar* (Linn.). Olsen and Stoner have quoted Kirkland. There are three reasons why this statement is probably incorrect: first, subsequent investigators on the gypsy moth have not, so far as I know, verified the alleged predatism; second, *insertus* is not a member of the predatory subfamily Asopinae, and third, its occurrence in large concentrated numbers precludes the likelihood that sufficient insect life occurs in the trees to sustain the species. I anticipate that both nymphs and adults will be found to suck sap from the stems, branches, or leaves of the living trees. If so, it appears to feed on trees of diverse relationship for it has been found associated with elm and hackberry (Balduf), beech (Blatchley), hard maple (Hart) and hickory (Van Duzee, 1904).

Life Cycle. The pieces of information at hand indicate that *insertus* hibernates as adult, as other Pentatomidae do. It was found "very abundant" in late October and early November on sidewalks under a row of maples on the University Campus at Urbana, and was presumed to be leaving the trees for hibernation (Hart). All but four of the 23 individuals recorded by Stoner from Iowa City were taken in November and mostly under the leaves of hickory or elm in wooded places. One of the four was "a hibernating form taken May 11": a half-grown nymph was found September 24 and the other two were obtained October 24. Blatchley stated "it probably hibernates as imago as a single example was taken October 17 from beneath a half buried log." Esselbaugh secured hibernating individuals beneath a rather thick layer of dead leaves in a woodland near Urbana, and the first active bug was taken on April 15 on a tree trunk on the University Campus.

The number of generations developed in a year is still suppositious. Little is reported concerning nymphs, and still less about the eggs. Esselbaugh caged one female and secured three egg masses in three successive days in early June. Whether the eggs are laid in nature by day among the dead leaves on the ground or by night on the bark or leaves of the living trees, or in both situations, remains unknown. Esselbaugh also succeeded in rearing the nymphs, but only one attained the fifth instar. Hart reported that nymphs occurred in June in Illinois. Therefore, unless the yearly developmental pattern contains a dispause, a second cycle can perhaps be completed here. Stoner found a half-grown nymph on September 24 and I discovered mature ones on June 19 and July 14 and 18. Further studies are needed before the significance of these four cases can be stated.

Distribution. While known to occur in places so widely separated as Ontario and Arizona, and Massachusetts and California, *M. insertus* has been reported from only a small proportion of the states. Its nocturnal and arboreal behavior, and what appears to be a tendency toward gregariousness, probably render the species less susceptible to collecting and explain the consequent spotty picture of distribution. It seems certain that it occurs also in many other states. Van Duzee (1917) reported it for Ontario, Massachusetts, New Jersey, Pennsylvania, Ohio, Illinois, Missouri, Nebraska, Kansas, Arkansas, Arizona and California. Olsen had it from Rockaway Beach, Long Island, New York; Blatchley found it in seven counties of Indiana on or south of the east-west line through Indianapolis, while Park and Strohecker observed it in northern Indiana. Blatchley also recorded it from Hopkinton, Massachusetts (Frost) and Raleigh, North Carolina (Brimley manuscript). The collection of the Illinois State Natural History Survey contained specimens from the northern, central and southern parts of the state (Hart), and the collection of the University has more than 100 specimens from the area of Urbana. Stoner found it at Iowa City, Iowa. The fact that Say received one of the type specimens from Thomas Nuttall, the English botanist, is noteworthy. Nuttall had it from Arkansas, presumably in the year 1818–1819, when he ascended the Arkansas River from the Mississippi (Pennell).

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An Instance of Sonification in Lepidoptera.—Sonification is not usually associated with Lepidoptera. A reminder that it does occur is contained in an interesting observation made in Mexico by Major George Miksch Sutton. Writing in the Audubon Magazine (Nov.-Dec. 1944, p. 347) he comments on a butterfly which produced a clicking sound with its wings.

This is a peculiarity of the neotropical genus *Ageronia* Hübner in the Nymphalinae, a species of which, *A. fornax* Hübner, has been recorded from the warmer sections of Texas, according to Dr. W. J. Holland. *A. feronia* Linnaeus may also be found there. Major Sutton described the butterfly he observed as checkered gray and white, a rapid flyer with a habit of alighting on tree trunks and facing head downward, all characteristics of the genus *Ageronia.*—Rowland R. McElvare, Port Washington, Long Island, N. Y.

INSECT DISPERSAL BY THE U. S. MAILS.

By Kenneth Fender, McMinnville, Oregon.

At different times the author, an employee of the post office at McMinnville, Oregon, has collected or had saved for him, specimens of insects that were found in incoming mail sacks. Most of the specimens so collected were in mail sacks from Council Bluffs, Iowa.

On July 22, 1939, a sack full of second and third class mail was opened and four specimens of the tiger beetle *Cicindela punctulata* Oliv. spilled out. Three of these were alive and quite active. There was a bit of a flurry as the author commandeered other employees to help corral his find. The fourth specimen was dead and somewhat smashed. On Aug. 8, 1939, another smashed specimen of *C. punctulata* was found in a mail sack from Council Bluffs. Another was taken under similar conditions on Aug. 4, 1941. A specimen of *Cicindela cuprascens* LeC. was collected from a mail sack on July 22, 1941. It too was dead and somewhat smashed. The point of mailing for the mail sack of this specimen was not determined but is presumed to be Council Bluffs which is the mail separation point for the eastern mail. A smashed specimen of the Scarab *Ligyrus gibbosus* (DeG.) was found in a mail sack (mailing point unknown) on July 25, 1938. At other times a living specimen of the bedbug *Cimex lectularius* L. and a crushed specimen of the butterfly *Eurymus philodice* Godt. were found and occasionally specimens wrecked beyond possible recognition have been seen.

Obviously the hard-shelled Coleoptera are best equipped for this rough means of dispersal. The arrival of the three very alive *Cicindela punctulata* proves that it can be done. No doubt numerous other insects in various stages of wear and tear have arrived at the McMinnville post office upon different occasions but have been either overlooked or dismissed by one of the employees as just another "bug." One wonders how many insects have been and are being dispersed through the U. S. mails.

A PHORID FLY FROM THE NESTS OF ANTHOPHORA IN CALIFORNIA.

By E. Gorton Linsley, Berkeley, Calif.

In March 1941, Mr. J. W. MacSwain and the writer (1942a: 195, tab. 1), collected pupae of a phorid fly from a nest cell of *Anthophora stanfordiana* Cockerell. The cell was one of a small sample (100 cells) taken from a bank about twenty miles east of Bakersfield, Kern County, California. This bank was largely occupied by *Anthophora linsleyi* Timberlake and has been described in connection with a study of this latter species (Linsley and MacSwain, 1942b). Because of the stage of development of the flies, it was not possible to determine the exact relationship of the fly to the *Anthophora*. However, since the adjoining cells in the series were occupied by bees, and the phorid cell was empty except for thirty-four fly pupae, it was presumed that the larvae had destroyed the original occupant, although it is possible that they had fed primarily on the store of pollen. The pupae were brought into the laboratory and adults emerged on April 12, 13, and 14, 1941, from thirteen to fifteen days after they were collected. These were sent to C. T. Brues, who found them closely related to *Megaselia pygmaeoides* Lundbeck a European species not previously found in this country. Dr. Brues states that it is quite possible that the two are not the same but that he cannot distinguish any differences.

A few phorids have been reported from nests of bees in eastern North America. Melander and Brues (1903) record *Megaselia halictorum* (Melander and Brues), and possibly also *M. cata* (Melander and Brues), *M. rostrata* (Melander and Brues) and *Stethopathus occidentalis* (Melander and Brues), from nests of *Chloralictus pruinosus* Robertson in Massachusetts. Malloch (1912: 494) states that *Megaselia rufipes* (Meigen) is "commonly found in beehives, and is a scavenger rather than an inquiline or parasite" and Essig (1926: 564) records this same species from "bees nests."

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RANDOM NOTES ON HETEROPTERA.

In White Plains, N. Y., October 7, 1913, was a beautiful, spring-like day, the temperature ranging between 40°–54°. On the hillside by Todd's Pond, under stones, the following bugs were found. *Aradus robustus* Uhler, 7 more or less active adults and 3 nymphs. *Podisus serieventris, Euschistus variolarius* and *Mormidea lugens* were torpid; but *Heraeus plebejus* was very active and got away. Some *Corythucha marmorata* were also found.

On September 12, 1914, at Rockaway Beach, L. I., under a trailing vine in the sand, there were abundant nymphs of *Lygaeus bicrucis,* in two or three instars.

In the beach washup, at Arverne, L. I., on October 3, of the same year, these Heteroptera were secured: Five *Brochymena quadripustulata,* 3 *Podisus serieventris;* and various *Mormidea lugens, Trichopepla semivittata* and *Nysius ericae, Euschistus variolarius, Crophius disconotus, Nezara hilaris, Hymenarcis nervosa,* one of each. *Amnestus spinifrons* yielded 7 specimens, and *Amnestus pusillus* 3. There were also two *Chariesterus antennator,* both thickly covered with a white pruinosity on the abdomen, thorax and sternum.

Two *Eremocoris ferus* were found under a stone on the Todd hillside in White Plains, N. Y., on November 3, 1917. The temperature ranged from 26° in the evening to 64° in the heat of the day.

Microvelia fontinalis T.-B. in an aquarium was seen feeding on *Daphnia.* The rostrum was extended forward and the water-flea carried impaled on the lancets.

J. R. T.–B.

ENTOMOLOGICAL TRIVIALITIES

By Phil Räu, Kirkwood, Mo.

III.

A Portrait of an Entomologist.

The entomologist seldom appears in literature, and when he does, he is usually the object of derision. "He has been ridiculed," says Dr. L. O. Howard, "in song, story, on the stage and in everyday life. The study of entomology in all its phases has been thought a ludicrous pursuit, and this popular attitude has undoubtedly had a very bad effect on the science."

Sooner or later, a change of attitude will come, and entomologists will rejoice in the good beginning in this direction made by the novelist, W. Somerset Maugham, in his short-story, "Neil MacAdam." Here he presents a portrait that gives the truest insight into the interests, ambitions and aspirations of a young entomologist that has yet appeared in literature.

Neil MacAdam, the young Scot, arrives in Borneo, so the story goes, to be the new Assistant to Angus Munro, the Curator of the Natural History Museum.

> With him, Munro, Neil let himself go. He felt for him as he had never felt for anyone before. He was so sane, so balanced, so tolerant. He was the sort of man he himself would like to be when he was older. He talked little, but when he did, with good sense. He was wise. He had a dry humor that Neil understood. . . . He was honest and absolutely truthful. But Neil admired him no less as a scientist than as a man. He had imagination. He was careful and painstaking. Though his interest was in research, he did the routine work of the Museum conscientiously.
>
> He was just then interested in stick-insects and intended to write a paper on their parthenogenetic reproduction. An incident occurred in connection with experiments he was making that made a great impression on Neil.
>
> One day a little captive gibbon escaped from his chain and ate up all the larvae and so destroyed the whole of Munro's evidence. Neil nearly cried. Angus took the gibbon in his arms and smiling stroked it. "Diamond, Diamond," he said quoting Sir Isaac Newton, "you little know the damage you have done."

> He was also studying mimicry, and instilled into Neil his absorbed interest in this controversial subject. They had interminable talks about it. Neil was astonished at the Curator's wonderful knowledge. It was encyclopedic, and he was abashed at his own ignorance. But it was when Munro spoke of trips into the country to collect specimens that his enthusiasm was most contagious. That was the perfect life, a life of hardship, difficulty, often of privation, and sometimes of danger, but rewarded by the thrill of finding a rare, or even a new species, by beauty of the scenery and the intimate observation of nature, and above all by the sense of freedom from every tie.

Later on they go on a collecting expedition:

> Every morning Neil and Munro started out separately, collecting. The afternoon was devoted to pinning insects in boxes, placing butterflies between sheets of paper, and skinning birds. When dusk came, they caught moths.
>
> Neil was enraptured. He explored the mountain in all directions. One day, to his pride, he found a new species of stick-insect. Munro named it Cuniculina MacAdami. This was fame. Neil (at twenty-two) realized that he had not lived in vain.

This sympathetic picture of a young naturalist in the field and in the museum should, I think, go a great way toward swerving an occasional potential bond salesman into the field of biological exploration. Unfortunately, however, young students do not often run into inspirational passages such as this, because biological textbooks contain nothing but facts. Items of romance are omitted, and yet we wonder why it is that with thousands of young people passing through biological courses every year, so few Forels, Rileys and Wheelers are produced.

PERSONALITIES.

Joseph F. Wright, one of our subscribers and contributors, is now a Captain in the Medical Corps, stationed in England.

We have received the first direct news from our friends in liberated Europe. We have had a post card from Dr. A. d'Orchymont, the Belgian authority on water beetles, from the Museum in Brussels.

We report the first loss in combat among our friends and subscribers, Peter C. Grassman, of Phoenix, Arizona, who was killed in action in Germany on December 4 of last year. We hope these losses will be few as time goes on, but we cannot conceal from ourselves that there will be others; and grievous losses to science in the coming years.

We have had a recent visit to the United States of Rev. Thomaz Borgmeier, O.F.M., of Rio de Janeiro, Brazil, who is editor of "Revista de Entomologia," the principal entomological journal of that country. He is reported to be here, among other things, for the purpose of establishing a Pan American Entomological Society. It is to be hoped he succeeds in this effort, which will do so much toward bringing together the United States and the Latin American countries in this science.

The death under sad circumstances is announced of Dr. Raymond C. Shannon, the well-known dipterist, in Trinidad, B. W. I., in March last. This is a great loss to entomology.

We regret to announce the death of Oscar Fulda, one of the old-time entomologists, who conducted The Butterfly Store, and who was known to so many of us of the older generation.

A KEY TO THE SPECIES OF CREMASTOCHEILINI OF NORTH AMERICA AND MEXICO (COLEOPTERA, SCARABAEIDAE).

By Robert W. L. Potts, Berkeley, Calif.

At the present time there is no key available to the species of the tribe Cremastocheilini which includes the species from Casey (1915) to date, while no recent key is primarily designed for ease of identification. Horn's key (1879 and 1885) is generally good but it is, of course, incomplete, and subsequent collecting has shown the need for modification of certain of his characters. Casey's key was descriptive in nature, not giving comparative characters only, and giving only textual clues to relationships. Cazier has recently (1939 and 1940) given careful consideration to the genera, but unfortunately never published a key to the species. In view of these circumstances it is believed that the following key will be useful.

Although a few changes have been made in the status of names, these changes have already been suggested in recent literature or are changes standing in the collection of the California Academy of Sciences. I have made one change in the application of a name, that of *cribripennis* Casey, to include the entire southern race of *Cremastocheilus armatus* Walker. The only modification of moment that this requires in the Casey description is to reduce the value of the medially carinate clypeus. In the few specimens of the southern California population I have available this character appears to be variable.

Several of the Casey species, while not definitely placed in synonymy due to the present impossibility of checking his types, are included with more definitely identifiable species. Otherwise the synonymy is as adopted in Leng's Catalogue and subsequent literature.

I wish to express grateful appreciation to Dr. E. G. Linsley and Dr. E. C. Van Dyke for helpful suggestions and criticisms, and to the latter for the opportunity of checking through the very extensive California Academy of Sciences collection. Thanks are also due O. L. Cartwright for his determinations of representatives from my own large collection.

1.[1] Pronotum with anterior angles entire, normal, not at all delimited 2

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[1] Parts of the key which define the genera and subgenera are modified from the generic revision of Cazier; the remainder is either modified from Horn, Casey, or original.

— Pronotum with an excavation or sinus medially delimiting each anterior angle . . . . *Cremastocheilus*—5

2. (1) Scape with median dorsal surface concave; tarsal constrictions not visible, segments overlapping distally 3

— Scape with this surface flat or convex; tarsal constrictions visible, segments not overlapping distally *Genuchinus*—4

Lissomelas

3. (2) Tarsi sculptured with longitudinal carinae; anterior margin of clypeus acute, beneath with a deep median impression; Ariz., Mex. . . . . *Lissomelas flohri* Bates

Psilocnemis

— Tarsi smooth, not carinate; anterior margin of clypeus not acute, prolonged beneath as a wide smooth flat plate, not medially depressed; Md. to N. C.
Psilocnemis leucosticta Burmeister

Genuchinus

4. (2) Prothorax nearly ½ wider than long, without a posterolateral tomentose border; elytra cuneiform, with very elongate variolate foveae discally; Ariz., So. Calif.
G. ineptus Horn

— Prothorax not over 1/5 wider than long, with a dense tomentose lateral border; elytra parallel or nearly so, with close-set elongate incised annuli discally; Ariz.
G. angustus Casey

Cremastocheilus

5. (1) Anterior tarsi with 4th and 5th segments greatly dilated, 4th almost twice size of 3rd; head with lateral carinae over eyes . . . . subg. *Macropodina*—6

— Anterior tarsi with 4th and 5th segments not dilated, subequal to 3rd; head without lateral carinae
subg. *Cremastocheilus*—8

6. (5) Pronotum rather evenly rounded at sides; pronotal punctuations large, coarse, shallow to deep but not particularly sparse 7

— Pronotum with side margins mostly straight, angulate at apical third; pronotal punctuations shallow, sparse, separated by 2 to 3 times their own widths; Ariz., So. Calif.
C. (*M.*) *puncticollis* Cazier

7. (6) Size appx. 16.5 by 7.0 mm.; dorsal surface of 4th anterior

tarsal segment subequal to ventral surface; Ariz., Calif. (= *ampla* Casey, fide Cazier 1940)
C. (*M.*) *planatus* LeConte

— Size appx. 13.0 by 5.0 mm.; dorsal surface of 4th anterior tarsal segment much shorter than ventral surface; Ariz.
C. (*M.*) *beameri* Cazier

8. (5) Pronotal disc more or less evenly rounded, at most with slight median or lateral depressions and minor modelling 9

— Pronotum marked into approximately equal thirds by two longitudinal depressions or grooves "Trinodia" group—34

9. (8) Mentum with basal notch, obsolescent to deep 10

— Mentum with base entire, rounded or angulate 16

10. (9) Mentum with basal notch deep, subparallel 11

— Mentum with notch shallow acute or rounded, or obsolescent 15

11. (10) Pronotal punctures normally coarse, rather evenly distributed on the disc; pronotum laterally without an impression at middle 12

— Pronotal punctures fine, with disc largely impunctate; pronotum laterally with an impression near middle; Eastern states .... C. *harrisii* Kirby

12. (11) Anterior angles of pronotum more or less continuous with disc; hind angles laterally continuous with disc, or, if separate, then strongly retracted toward median line 13

— Anterior angles of pronotum separated by a complete transverse groove; hind angles separated by an oblique groove or impression and only slightly retracted; from Rocky Mountains east, Canada to the Gulf C. *castaneae* Knoch

Great Plains and Mississippi Valley
C. c. *lecontei* Westwood

Northern and Rocky Mountain, Manitoba to Colo.
C. c. *pocularis* Casey

Southern States (?)[2] .... C. c. *brevisetosus* Casey

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[2] Casey describes *brevisetosus* from a specimen he records from Iowa. However, the only specimens before me which agree are from Alabama, and I am led to suspect an erroneous label on the Casey specimen. In the Alabama specimens the setae of the pronotum are exceedingly broad and short and as the specimens are quite fresh, the character is presumably a good one. This appears to me to be the most distinctive race of any I have seen, and if this name is applicable to the southern specimens it apparently represents a valid subspecies. The value of the other two names as

13. (12) Hind angles separated from disc and strongly retracted; Great Plains Area 14

— Hind angles more or less continuous with disc at outer margin, not particularly retracted; Ohio Valley and Atlantic Coast, Can. to Ga. . . . . *C. canaliculatus* Kirby

14. (13) Legs and entire body deep black, Iowa to Texas *C. retractus* LeConte

— Legs rufo-piceous; head and body more or less rufo-piceous to brown-black; Kan., Colo. . . *C. retractus incisus* Casey

15. (10) Hind angles considerably retracted; anterior angles prominent and distinct; mentum with basal notch shallow, triangular or rounded and sometimes obsolescent; Mountain States to Atlantic, Mass. to S. C. *C. variolosus* Kirby

— Hind angles feebly retracted; anterior angles more or less continuous; mentum with basal notch small, narrow, subparallel; N. C. to Fla. . . . . *C. squamulosus* LeConte

16. (9) Posterior angles of prothorax defined by a more or less complete oblique impression or deep groove; hind tarsi long or short 17

— Posterior angles considerably retracted and poorly or not at all defined; hind tarsi usually notably short and strongly compressed 30

17. (16) Hind tarsi with 2nd segment usually distinctly longer than wide, but if short, lateral basal depressions marked and carinate at dorsal margin 18

— Hind tarsi with 2nd segment at least nearly as wide as long; lateral depressions slight or absent, never carinate at edges; Calif. (including *C. compressipes* Casey) *C. angularis* LeConte

18. (17) Hind angles considerably retracted and depressed below plane of pronotal disc; surface shining, often somewhat rufo-piceous 19

— Hind angles continuous with side margin of pronotum, only slightly retracted and depressed; surface opaque or subopaque 20

19. (18) Posterior margin of mentum produced and pointed; elytral punctures rather small and well spaced; anterior pronotal angles pointed; Nebr., Mo., Kan. *C. nitens* LeConte

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weak races of *castaneae* seems questionable to me. A long series from the Rocky Mountains is not easily separable, although in the main, they most closely agree with Casey's *pocularis*.

— Posterior margin of mentum evenly rounded; elytral punctures large, shallow and separated by about own width; anterior pronotal angles notably wide and blunt; Ariz.
C. chapini Cazier

20. (18) Front of head rather evenly rounded down into clypeus; anterior pronotal angles usually distinct and oblique in direction 21

— Front of head angulate, often almost carinate, dropping very abruptly to clypeus and giving top of head a definite rather flat and distinct area; anterior angles not or rarely distinct, more longitudinal in direction 24

21.[3] (20) Upper surface with hairs short, hardly longer than areolae, very sparse or almost absent, particularly on elytra, never conspicuous 22

— Upper surface with conspicuous, rather long hairs; Brit. Col. to Calif. and Nev. .... *C. armatus* Walker

22. (21) Hind tarsi only 2/3 to 3/4 as long as tibiae 23

— Hind tarsi at least within 1 mm. of being as long as tibiae; Coastal from Ore. to middle Calif.
C. armatus maratimus Casey

23. (22) Elytral punctures nearly round, shallow; clypeus never more than faintly carinate; Inland ranges from Wash. to Calif., Nev. (including *C. congener* Casey)
C. armatus montanus Casey

— Elytral punctures elongate, deeper; clypeus sometimes definitely carinate at middle; So. Calif.
C. armatus cribripennis Casey

24. (20) Legs rufous; body more or less rufous 25

— Legs and body black 26

25. (24) Legs rufous, but head and body mostly blackish; size appx. 13.0 by 6.0 mm.; Ariz. ..... *C. mexicanus* Schaum

— Legs, head and body uniform reddish-brown; size appx. 15.0 by 6.0 mm.; Durango, Mex. .... *C. robinsoni* Cazier

26. (24) Pronotum apparently subquadrate, widest at about basal third, with space between apices of hind angles less by about .2 to .35 mm.; elytral setae sparse but usually long and conspicuous, up to 1 mm. in length 27

— Pronotum apparently rounded, widest at or before middle, with space between apices of hind angles less by about .35

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[3] *C. densicollis* Casey and *obliquus* Casey will probably key out to either *C. armatus maratimus* or *C. a. montanus*.

to .45 mm.; elytral setae barely demonstrable, never conspicuous 29

27. (26) Clypeus no wider than front between eyes 28

— Clypeus wider than head across eyes; N. M., Tex. *C. crinitus* LeConte

28. (27) Top of head with two rather well-developed foveae antero-laterally; Brit. Col. to Ariz. and N. M. *C. crinitus bifoveatus* Van Dyke

— Top of head nearly flat, not at all or only slightly depressed within the antero-lateral margin; Wash. to western Colo. *C. crinitus pugetanus* Casey

29. (26) Head, body and legs without evident bloom; Great Plains and Mississippi Valley, Manitoba to Ill. and N. M. (including *C. knochi gracilipes* Casey and *C. k. areolatus* Casey) . . . . *C. knochii* LeConte

— Head, body and legs with areas of bloom; N. M. *C. pulvurulentus* Cazier

30. (16) Pronotal width greatest at or slightly behind middle, punctures not coarser at middle and hairs always setiform 31

— Pronotal width greatest at hind angles, punctures coarser at middle and hairs there more squamiform; Ariz. *C. quadratus* Fall

31. (30) Anterior tibiae bidentate 32

— Anterior tibiae tridentate; So. Calif. *C. westwoodi tridens* Casey

32. (31) Posterior tarsi 1/2 or less the length of tibiae 33

— Posterior tarsi from 1/2 to 3/4 the length of tibiae; So. Calif. *C. westwoodi* Horn

33. (32) Anterior tibiae appreciably longer than their width taken twice; So. Calif. . . . . *C. schaumi* LeConte

— Anterior tibiae about twice as long as wide; So. Calif., Ariz. *C. schaumi tibialis* Casey

"TRINODIA" group

34. (8) Tarsi 5-segmented 35

— Tarsi 4-segmented . . . . *C. lengi* Cazier

35. (34) Pronotal impressions continuing from base to apex; clypeus not laterally dilated and with a median carina . . . 36

— Pronotal impressions extending from base to about middle; clypeus laterally dilated and not carinate; Mont. and Nebr. to So. Calif. . . . . *C. wheeleri* LeConte

36. (35) Front of head without a transverse impression in front of eyes; pronotum definitely more than half as wide as elytra 37

— Front of head with a tranverse impression in front of eyes; pronotum only barely more than half as wide as elytra; Ariz. .... *C. constricticollis* Cazier

37. (36) Anterior tibiae slender, subpedunculate basally, the inner margin rather abruptly constricted at about middle; the upper two teeth at about middle, the two thus less approximate 38

— Anterior tibiae notably broad and compressed, or moderately slender, but not subpedunculate basally, the inner outline continuous and not constricted; if moderately slender, the upper tooth well beyond middle, the teeth not so widely separated 39

38.[4] (37) Smooth and shining; hind angles of prothorax rather short; Nebr. and Colo. to Tex. ...... *C. saucius* LeConte

— Hairy and subopaque; hind angles twice as long and with a lateral excavation of prothorax just anterior to angle; Ariz. .... *C. hirsutus* Van Dyke

39. (37) Anterior tibiae moderately slender 40

— Anterior tibiae as well as femora notably broad and compressed 43

40. (39) Hind pronotal angles acute, projecting posteriorly; length appx. 11.0 mm. 41

— Hind pronotal angles rather long, slender and everted; length appx. 7.5 mm.; Tex. .... *C. spinifer* Horn

41. (40) Dorsally shining 42

— Dorsally opaque; So. Calif., Ariz. .... *C. opaculus* Horn

42. (41) Clear testaceous; pygidium in part scabriculate; Kan. *C. setosifrons* Casey

— Black; pygidium concentrically sculptured by short, fine, irregularly incised lines; Tex. .... *C. quadricollis* Casey

43. (39) Piceous; hind angles of pronotum upturned at outer edge above; head less punctate, front less pilose; Ariz. *C. planipes* Horn

— Reddish; hind angles flat at outer edge; head much more densely punctate and front more pilose; Ariz. *C. mentalis* Cazier

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[4] *C. excavatus* Cazier, from Durango and Tlalnepantla, Mexico, would probably key to this couplet. No specimen is at present available and the description does not seem to adequately distinguish the species from *C. hirsutus* Van Dyke.

OCCURRENCE OF TRIGONURUS (COLEOPTERA, STAPHYLINIDAE) IN THE CONIFEROUS FORESTS OF WESTERN OREGON.

By James A. Macnab and Dorothy McKey Fender, Linfield College, McMinnville, Oregon.

Repeated collection of two species of *Trigonurus, T. crotchi* Sharp and *T. sharpi* Blackwelder, under consistently uniform conditions has led the authors to believe that publication of collection records, in the light of information gained as to habitat, distribution, and relative abundance of these two species which occur together, might be of interest.

1. Depoe Bay, Lincoln County, April 24, 1936. Evergreen log. 6 *T. sharpi,* of which 5 (1 a paratype) are in the Fender collection. K. M. Fender coll.
2. Depoe Bay, Lincoln County, April 25, 1936. 2 *T. crotchi.* K. M. Fender coll. Specific determination of the logs in which the Depoe Bay specimens were collected was not made. Since Sitka spruce (*Picea sitchensis*) is a dominant tree in this restricted locality, the logs were probably this species.
3. Saddle Mountain (Boyer), Lincoln County, April 25, 1936. Douglas fir log. 25 *Trigonurus,* of which 10 *T. crotchi* and 2 *T. sharpi* were retained. Jas. A. Macnab coll.
4. Saddle Mountain (Boyer), Lincoln County, May 24, 1936. Hemlock log. 3 *T. crotchi.* Jas. A. Macnab coll.
5. Saddle Mountain (Boyer), Lincoln County, June 8, 1936. Hemlock log. 1 *T. sharpi.* Jas. A. Macnab coll.
6. Saddle Mountain (Boyer), Lincoln County, July 20, 1936. Hemlock log. 12 *Trigonurus,* of which 5 *T. crotchi* and 1 *T. sharpi* were retained. Jas. A. Macnab coll. These specimens were all concentrated in an area of 25 sq. cm. on the wet surface of the sap-wood.
7. Ocean Park, Lincoln County, August 14, 1938. 1 *T. sharpi.* K. M. Fender coll. Although data is lacking, this specimen was almost certainly collected under bark.
8. McMinnville, Yamhill County, March 9, 1939. Douglas fir log. 2 *T. sharpi.* D. M. Fender coll.

These collections and observations indicate that *Trigonurus crotchi* and *T. sharpi* are usually collected between the bark and sapwood of logs which are very moist and in that preliminary stage of decay in which the bark remains in a fair state of preservation and the sapwood still presents an unbroken surface, though it may be pulpy for one-half to three inches in depth. Blackwelder[1] notes that *T. crotchi* has been reported beneath bark of *Abies* sp. and doubtfully from *Pinus* spp., while *T. sharpi* was taken "under bark." No other habit records are given. It also appears to be established by the records reported in this paper that *T. crotchi* and *T. sharpi* are both found under the bark of spruce (*Picea sitchensis*), Douglas fir (*Pseudotsuga mucronata*), and western hemlock (*Tsuga heterophylla*). Furthermore, the occurrence of these species in such habitats is apparently governed largely by the moisture content of the environment beneath the bark, since, although no measurements were made, in all three types of logs this factor was comparable. The consistent ratio of five to one in the numbers of identified specimens of *T. crotchi* compared to *T. sharpi* in the two collections made under definite areas of bark on Saddle Mt. April 25 and July 20, 1936, indicate that in this locality at least, *T. crotchi* may be nearly five times as numerous as *T. sharpi.* It would be interesting to know whether this ratio would hold in further collecting and over the rest of the range which these two closely related species occupy.

MORE UNKIND WORDS.

Perhaps the outstanding qualities scientific writing should have are directness, simplicity, and clarity.

Descriptive entomology is of necessity highly complex, but within its own framework, it should at all times show these three qualities. But what do we see?

The abandonment of old established terms for new words to express the same thing, frequently wrongly constructed, or barbaric neologisms made out of whole cloth; or a substitution of many-syllabled transliterations of doubtful latinity, for plain English when the latter is available and just as exact and better understood than the special coinage.

Huxley once said "There are people who believe that when they invent a new term, they have added measurably to the content of science."

J. R. T.-B.

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[1] Blackwelder, R. E. 1941. A Monograph of the Genus *Trigonurus* (Coleoptera: Staphylinidae). American Museum Novitates, No. 1124. pp. 5 and 7.

CATALOGUE OF THE LONCHOPTERIDAE[1] OF THE WORLD.

By William F. Rapp, Jr., and Willis E. Snow, Urbana, Ill.

The family Lonchopteridae is composed of small flies which are found in damp places. Very little work has been done on the group until recently when Curran[2] revised the North American species and Czerny[3] revised the palearctic species. Since the publication of the Kertesz catalogue in 1909, so many new species have been described that it has been thought advisable to bring it up to date.

	Kertesz 1909	Rapp & Snow 1945
Lonchoptera	8	23
Cadrema	1	—
	9	23

Lonchoptera[4] Meigen.

Lonchoptera acinaris (Seguy), Mem. Mus. H. N. Paris (N. S.), vol. 8 (1938), p. 335.
Kenya.

Lonchoptera africana Adams, Kans. Univ. Sci. Bul., vol. 3 (1905), p. 159.
Rhodesia.

Lonchoptera apicalis Okada, Ins. Mats., vol. 10 (1935), p. 36.
Japan.

Lonchoptera borealis Curran, Amer. Mus. Novitates, 696 (1934), p. 4.
Alaska, Ontario, New York, Quebec.

Lonchoptera dubia Curran, Amer. Mus. Novitates, 696 (1934), p. 5.
New York, Nova Scotia, Quebec, Ontario, British Columbia, Massachusetts, New Hampshire, Connecticut, New Jersey, Pennsylvania, District of Columbia, North Carolina, Wisconsin, California, Chile, Argentina.

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[1] Musidoridae of authors.

[2] Curran, C. H. The North American Lonchopteridae (Diptera) Amer. Mus. Novitates, 696 (1934), pp. 1–7.

[3] Czerny, Leander Die Fliegen der Palaearktischen Region—Musidoridae, Lieferung 83, pt. 30 (1934), pp. 1–16.

[4] Musidora of authors.

Lonchoptera fallax de Meijere, Tind. V. Ent., vol. 49 (1906), p. 84; *lutea* Meigen, System, Beschreib, vol. 4 (1824), p. 107; *flavicauda* Strobl., Mitteil. Verein. Steiermark, (1892), p. 158.
Central Europe.

Lonchoptera furcata Fallen, Dipt. Suec. Phytom., (1923), p. 1 (Dipsa) ; de Meijere, Tijd. V. Ent., vol 49 (1906), p. 72.
Central Europe, England, Madeira, Asia.

Lonchoptera hakonensis Matsumura, 6000 Ill. Ins. Jap. (1931), p. 362.
Japan.

Lonchoptera kamtschatkana Czerny, Flieg. Pal. Reg., vol. 30 (1934), p. 10.
Kamtschatka.

Lonchoptera lutea Panzer, Fanna german., vol. 108 (1809), p. 20; de Meijere, Tijd. V. Ent., vol. 49 (1906), p. 64.
Europe, England, Asia.

Lonchoptera meijerei Collin, Ent. Mon. Mag., vol. 74 (1938), p. 63.
England.

Lonchoptera nigrociliata Duda, Konowia, vol. 6 (1927), p. 96.
Silesia, England.

Lonchoptera nitidifrons Strobl, Tijd. V. Ent., vol. 49 (1906), p. 86.
England.

Lonchoptera occidentalis Curran, Amer. Mus. Novitates, 696 (1934), p. 4.
Alaska, California, Idaho.

Lonchoptera orientalis Kerterz, An. Mus. Hungar., vol. 12 (1914), p. 675.
Formosa.

Lonchoptera pictipennis Bezzi, Bull. d. Soc. Entom. Ital., vol. 30 (1899), p. 161; de Meijere, Tijd. V. Ent., vol. 49 (1906), p. 82.
Germany, Italy.

Lonchoptera platytarsis Okada, Ins. Mats., vol. 10 (1935), p. 38.
Japan.

Lonchoptera rakonensis Aldrich, Psyche, vol. 25 (1918), p. 376.
Japan.

Lonchoptera scutellata Stein, Wien. Ent. Zeit., vol. 9 (1890), p. 109; de Meijere, Tijd. V. Ent., vol. 49 (1906), p. 81.
England, Germany, Austria.

Lonchoptera stackelbergi Czerny, Flieg. Pal. Reg., vol. 30 (1934), p. 13.
Ussuri.

Lonchoptera strobli de Meijere, Tijd. V. Ent., vol. 49 (1906), p. 86.
Europe.

Lonchoptera tristis Meigen, Syst. Besch., vol. 4 (1824), p. 110; de Meijere, Tijd. V. Ent., vol. 49 (1906), p. 78.
Europe, England.

Lonchoptera uniseta Curran, Amer. Mus. Novitates, 696 (1934), p. 2.
Colorado, Quebec, British Columbia.

Random Notes on Thasus Acutangulus.—From my field notes I give the following observations on *Thasus acutangulus* Stål, which is probably the biggest of our American land bugs. On August 27, 1941, it was abundant on its common food-plant, mesquite (*Prosopis velutina*—this has other Latin names), in a little grove in Tombstone, Arizona. The following year, on May 9, there was not even one to be found on the identical trees. But on June 28, I was called to the home of Mr. Emil Van Hulse, in Tucson, to see a veritable plague of big bugs on the trees in his patio, the mesquites. As I had suspected, it was *T. acutangulus*. They were reported as swarming on the trees, but when I arrived at 4 P.M. Mountain Standard Time, there were only two masses clinging to the twigs and hanging down in clumps holding on to each other. There were also some last instar nymphs on the tree trunk and among the clumps, known because two of them taken home molted to the adult *Thasus*. One of the clumps, including the nymphs, was brought back alive; the other flew off. The insect seems a very powerful flier. Apparently, it is very selective as to its habitation, since another mesquite close by had none on it. Those noted were in the great majority males; there was only one female in the lot kept. The individuals taken home were placed on a small mesquite in the neighboring yard. They made no attempt to fly away or scatter, but at once began to feed on the tender green twigs. Later, they were observed feeding on the green mesquite pods, grouped together—the insect seems to be gregarious and migratory, as there was a change in the number and in the sexes. They left off and on; and by August 26 there were none.—J. R. de la Torre-Bueno, Tucson, Arizona.

BOOK NOTES.

South America Called Them: Explorations of the Great Naturalists—La Condamine, Humbolt, Darwin, Spruce, by Victor Wolfgang von Hagen. Pp. i–xii + 1–311 + i–ix. (Alfred Knopf. 1945. $3.75.)

As entomology develops, it becomes less and less a mere cataloguing of species, a field for describers of new species, and less and less a poor handmaiden humbly working hand and foot for the cold dogma of evolution. It is at length questioning life itself in all its guises. No longer is the entomologist judged solely by the number of dubious new species he has described; the criterion is justly becoming the quality and quantity of how much he knows about the life, habits and abiding places of insects. No longer is "N. Am." an adequate designation their local habitat; nor even "France" nor "U. S." We have now gone beyond this to the place where the exact spot, the food-plant (or host-plant), the altitude and even the ecological surroundings, all have become necessary for the proper evaluation of a species and of its proper place in life.

"S. Am." or "Amazons" are scarcely sufficient indication of distribution. South America is so vast and varied; the Amazon River system so huge; the Andean range reaches far into the clouds; the continent itself stretches from the tropics in the north to the sub-Antarctic in the south. Bates wrote about the Brazilian Amazon; Murphy has written about the bird islands of Peru. But long before their time there were four great explorers and observers of nature: La Condamine, Humboldt, Darwin, and the less-known Spruce. The works of Darwin, particularly "The Voyage of the Beagle" and the "Origin of Species," are readily available in many editions and in many languages. The Voyage of the Beagle gave the setting for faunistic studies of the Southern Continent; the Origin of Species set him on an eminence. Darwin's works are still conned in the seats of biology.

But before him were two of these great men, whose works are equally valuable in their fields. La Condamine and Humboldt wrote profusely on their observations and discoveries, publishing many great tomes. These works are so costly and inaccessible that few biologists have even seen them, full as they are of first-hand and accurate observations on tropical nature. Spruce, coming later, a great botanical discoverer, is still less known even though he enriched botany with the thousands of specimens of new and rare plants he sent to the great centers of European science.

Von Hagen, in his book, presents short but interesting accounts of these great discoverers in their South American travels. In doing this, he shows a revealing picture of the marvels and diversity of this part of the world, still so little known to us now.

Entomologically, South America called Them fills in the background in which to set the insects from the southern continent. It accentuates the great diversities of climatic and geography. It presents a vivid picture of the wilderness calling to entomologists as a practically untouched field for discovery. Only the edges of this richest of the continents have been touched; its heart is still to be entered.

Through these four short biographies, von Hagen has set before us the living whole of a living land, its marvels and its scope. Even as Africa is termed "The Dark Continent," so South America may be called "The Bright Continent," so sun-drenched and flower-spangled is the land.

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ARTICLES.

Our *Entomologica Americana* for 1944 (vol. XXIV) has carried three monographs on specific insect groups and one extensive article on heliotropisms, as follows:

A Review of the Subgenera Stenocantharis Gistel and Neocychrus Roeschke of the Genus Scaphinotus Dejean, by Dr. Edwin C. VanDyke is no. 1, pp. 1–19. This is a critical and synonymic commentary on these two subgenera.

Selection of Colored Lights by Night-flying Insects, by Lorus J. Milne and Margery J. Milne, fills no. 2, pp. 21–86, with figures 1–4. The authors present an extensive study on the attraction to insects of light of different wave-lengths, together with extensive classified lists of insects (660 species in 12,869 specimens) with description of techniques and controls.

A Review of the North American Species of the Genus Carabus Linnaeus, by Dr. Edwin C. VanDyke, fills no. 3, pp. 87–137, with plates III–VI. This is another synonymic study, with redescriptions of numerous species, distribution, etc.

The Genus Phyciodes, by Dr. Wm. T. M. Forbes, fills no. 4, pp. 139–207, with plates VII–XIV. This paper is a running commentary on Arthur Hall's revision of the genus, with changes, notes and localities, and numerous keys to groups and species.

Another publication for notice is that great journal, which has completed its 40th volume in 1944, the "Memorias do Instituto

Oswaldo Cruz," of Rio Janeiro, Brazil. This publication refers largely to Tropical diseases, but it is of entomological interest because of its articles on insect vectors of so many protozoan infections. No. 2 of this volume, pp. 191–194 carries an interesting study on the use of organism-free triatomine reduviids to test the presence of *Schizotrypanum* in the blood of artificially infected pigeons, in experiments reported by Emanuel Dias. In no. 3, pp. 209–340, Dr. Cesar Pinto reports on a year's work against parasitic disease. The entomological interest lies in malaria prevention work, near Rio-Bahia from 1942–1943.

The Texas State Health Department has published a Bulletin on the "Mosquitoes of Texas," in 100 pages with 32 figures, keys for determination and studies in ecology. It is dated 1944.

J. R. T.-B.

Leafhoppers Swarming (Homoptera, Cicadellidae).—While walking home early in the evenings of November 1 and 2, 1944, many small insects were seen hovering at the tips of branches of various trees (especially Norway maple) which still held many of their leaves. It was thought the insects were small crane-flies, some of which were seen, but peculiarities of flight raised a doubt as to their identity, so a few specimens were snatched by hand from the air. They were found to be one of our most common leafhoppers, *Phlepsius irroratus.* The temperature was unusually high, over 70° F., and a light south wind was blowing. The hovering swarms were perceptible on the leeward side of the tree as high as twenty feet. Occasionally an individual would fly several yards from the tree and return. A friend who operates a light-trap for moths at a second-story window later reported that his trap was "full of leafhoppers" on the nights of November 1 and 2.—George Steyskal, Detroit, Michigan.

EDITORIAL.

Oh, Yeah?

The New York Sun, which Shines for All, had this item in a recent issue:

"Not too Cold for Them."

"Entomologists have found that the *moth worms* (Italics ours) can live as long as sixty-seven days at a temperature of about 20 degrees Fahrenheit."

Science is wonderful! Especially newspaper science! If any one of us were to take time off to correct every erroneous statement in newspapers and magazines, we would have to spend a large part of our days writing letters to the paper—but we have so many other things to do!

Every newspaper should have a staff of domesticated scientists to kill this misinformation, which makes science ridiculous, and the newspaper also. The worst of it is that this nonsense finds lodgment in minds, when a longer correct article would not even be read.

If this particular editor took time to correct all the feeble-minded trash about South America, about which he is somewhat informed, in one Tucson newspaper he would have to pen one long letter a day to try to overcome the harm such errors cause.

In all seriousness, these stray fillers from the clip sheet, *are* read, *are* remembered. They ought to be correct, because they are in effect a good means to promote truth and to spread actual factual knowledge.

"Hope springs eternal in the human breast." And men live by hope. But it is not always realized. Perhaps this is one of the futile hopes.

J. R. T.-B.

Dangerous Beetles.—The misuse of English, the failure to say what we mean, even though not attaining the point beyond which the reader is able to interpret what was in the author's mind, rather than what he put in type, is an irritating habit of inexperienced writers. That entomologists are not always guiltless is illustrated by the following delicious quotation from a recent article: "Locomotion, i.e., climbing, jumps and kicks, were (sic!) found to be the most effective forms of protection against carabids in captivity".—J. C. B.

PROCEEDINGS OF THE SOCIETY.

Meeting of March 11, 1943.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum, on March 11, 1943. The meeting was called to order at 8:15 P.M. by President Wm. T. Davis.

Members present were F. T. Naumann, R. R. McElvare, Otto Buchholz, Wm. T. Davis, A. T. Gaul. Visitors included, L. F. Byars, A. G. Webb and H. Boyd.

Minutes of the preceding meeting were read and approved. The Treasurer delivered a satisfactory report.

Mr. A. G. Webb, the speaker of the evening, discussed "Plant Quarantines on the Canadian Border."

Although the Canadian authorities maintain certain Plant Quarantine regulations regarding the importation of foreign plant commodities into Canada, the Canadian flora and the United States flora are so different that we must maintain strict quarantines. For instance, Canada has no Citrus or Cotton belts. It is therefore unnecessary for them to maintain quarantines against cotton or citrus fruits. However, such material when allowed into Canada from a foreign country cannot very well be permitted entry into the United States without undergoing proper fumigation and treatment.

Of course the agriculture of the northern states and the southern provinces is the same, and it would be impossible to segregate the native faunas of these two political divisions. We have little to fear from the natural exchange of native species from the southern belt of Canada.

The great northern areas of Canada in the arctic and subarctic zones present little hazard as the indigenous fauna has little chance to be imported by human means, because of the small population.

The meeting adjourned at 10:00 P.M. after an interesting discussion.

Respectfully submitted,

A. T. Gaul,
Secretary.

Meeting of May 13, 1943.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on Thursday, May 13, 1943.

The meeting was called to order at 8 P.M. by President Wm. T. Davis. Members in attendance were Edwin Way Teale, Otto Buchholz, R. R. McElvare, Fred T. Naumann, John W. Noaks, Wm. T. Davis and A. T. Gaul. Visitors included Mr. A. G. Webb and J. Fabricant.

The minutes of the preceding meeting were read and approved. The treasurer submitted a satisfactory report.

Mr. A. G. Webb presented the kodachrome motion picture showing the enforcement of the Foreign Plant Quarantines.

After an interesting discussion, the meeting was adjourned at 10:00 P.M.

A. T. GAUL, *Secretary.*

MEETING OF OCTOBER 14, 1943.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum, October 14, 1943.

The meeting was called to order by President Wm. T. Davis at 8 P.M. The minutes of the preceding meeting were read and approved. The treasurer submitted a favorable report.

Members in attendance were: W. T. Davis, John W. Noaks, Edwin Way Teale, F. T. Naumann, Henry J. Dietz, John M. Sheridan, Otto Buchholz, Alan S. Nicolay, R. R. McElvare and A. T. Gaul. Visitors included: Mr. Richard Underwood and Miss B. Dietz.

Mr. McElvare nominated Dr. Hanson for membership in the society. The motion was made that the by-laws be suspended and Dr. Hanson was elected to membership by unanimous vote of the society.

Mr. Teale moved that in consideration for his services to the society, Mr. Bueno's membership dues and subscriptions to the Bulletin and Entomologica Americana be permanently waived. This motion was passed by unanimous vote of the society.

The program of the evening was the summer experiences of members.

Mr. Noaks reported on field trips in Flushing and Staten Island, and mentioned having captured several Ichneumons mating.

Mr. Teale showed photographs of various insect eggs. He also showed a peculiarly formed mantis egg case found along the shore of Long Island. He reported having worked on the revision of qualifications for receiving merit badges for Insect Study in the Boy Scouts of America. He impressed upon the members the need for qualified examiners for this merit badge in most of the communities in the country.

Mr. Naumann reported that he expected to have better collecting next season, but that he had taken several field trips and had been rearing several species of forest Lepidoptera.

Mr. Dietz reported a very heavy outbreak of canker worms in Scarsdale. He said that he found butterflies very plentiful while Catocalas were scarce.

Mr. Davis showed a hummingbird which had been found dead in New Jersey. He had mounted it like a moth. He demonstrated a native species of fiddler crab with red joints. He remarked upon the song apparatus of cicadas; *Platypedia* has no true song but it rubs its wings to create "ticking" sounds. Certain New Zealand cicadas make both kinds of sounds.

Mr. McElvare spoke of the abundance of carpenter bees and bean beetles, this season.

Mr. Sheridan remarked that the Ailanthus webworm was a terrible pest in Brooklyn this summer.

Mr. Nicolay discussed his work with fungus beetles and myrmecophiles. He described the return of vegetation to the area formerly occupied by the famous Morgan, N. J., munitions factories. This land is now completely covered with new growth and nowhere is there evidence of the buildings which were blown up in World War I.

The meeting adjourned at 10 P.M.

A. T. Gaul, *Secretary.*

Meeting of November 11, 1943.

A regular meeting of the Brooklyn Entomological Society was held at the Plant Inspection House, 209 River St., Hoboken, N. J., on November 11, 1943.

The meeting was called to order at 8:15 P.M. by President Wm. T. Davis. Members present were, Mr. F. T. Naumann, Edwin Way Teale, Wm. T. Davis, J. W. Noaks and A. T. Gaul. Visitors were Dr. George Becker and Messrs. Snyder and Moore.

The minutes of the preceding meeting were read and approved.

Dr. Becker escorted the meeting through the Inspection House, explaining the operation of fumigation chambers and other treatment facilities, parasite rearing rooms, etc.

After an interesting discussion, the meeting adjourned at 9:30 P.M.

A. T. Gaul, *Secretary.*

Meeting of December 16, 1943.

The regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on Dec. 16, 1943 at 8:00 P.M. The members attending were Mr. Wm. T. Davis, Mr. Rowland

R. McElvare, Mr. Otto Buchholz and Mr. John W. Noaks. Due to the fact that few were present Mr. Davis declared the meeting not regular. In the absence of the secretary the minutes were not read. Mr. Wm. T. Davis remarked on the passing of a number of members and friends of our Society since the lamented death of our Treasurer, Mr. George P. Engelhardt on May 24, 1942.

Mr. Wm. Eisenhardt, a long-time active member of the Society, died on Oct. 16, 1943. Dr. Frank E. Lutz, aged 64, on Nov. 27; Mr. Christian F. Groth, aged 79, on Dec. 12, and Dr. E. P. Felt, aged 75, on Dec. 14, 1943.

Mr. Davis also called attention to the death of Dr. Elmer D. Ball, aged 73, on October 5. At one time Dr. Ball served the National Government as Assistant Secretary of Agriculture. He had long been a student of the Homoptera, and the Cicadas, *Okanagan balli* (1919), and *Platypedia balli* (1936), are named in his honor. He collected the *Okanagana* in Iowa, and the *Platypedia* in Arizona. Dr. Ball visited Staten Island to examine the collection of Cicadas now in the museum of the Staten Island Institute of Arts & Sciences. An appreciation account of Dr. Ball's useful life is to be found in *Science* for Dec. 10, 1943.

The Treasurer's report was given and was accepted by the Society.

Mr. Buchholz showed an unusual male specimen of *Melepotes jucunda* whose uppermost part of the middle tibiae was spread into an oval spherically shaped mass of soft hairs. Mr. Buchholz mentioned this specimen as the first one he had ever seen formed in this manner.

The speaker of the evening was Mr. John W. Noaks who talked on the Effect of Sodium Chloride Upon the Larvae of *Culex pipiens*. Mr. Noaks illustrated his talk with a graph and several specimens. A paper, giving a complete description of this experiment, will appear in the Bulletin of the Brooklyn Entomological Society.

The meeting adjourned at 10:00 P.M.

JOHN WILLARD NOAKS, *Acting Secretary.*

MEETING OF JANUARY 13, 1944.

The annual meeting of the Brooklyn Entomological Society was held in the Brooklyn Museum on January 13, 1944.

The meeting was called to order at 8:15 P.M. by president Wm. T. Davis. Those present were as follows: Messrs. Otto Buchholz,

J. Sheridan, R. R. McElvare, Edwin Way Teale, Wm. T. Davis and J. Noaks.

The minutes of the preceding meeting were read and approved.

The treasurer submitted a satisfactory report on the financial proceedings for the year 1943. The treasurer mentioned that he wrote to Departments of Agriculture of the states raising cattle in order to further advertise Dr. Becquaert's book on Ked Flies. Other steps have also been taken.

The report of the publication committee was submitted by Mr. Teale as follows: Boving and Craighead's Larvae of Coleoptera has been selling at an encouraging rate, while the price has been raised from seven and one half to nine dollars.

Due to war conditions, the number of pages in our Bulletin have been limited to 220 pages per year, in five issues. The report was accepted by the society.

The nominating committee's report was submitted by Mr. Sheridan. For president, Wm. T. Davis; Vice-President and Treasurer, Mr. R. R. McElvare, Secretary, Mr. Gaul; Publication committee, Mr. Torre-Bueno, editor, Mr. Teale and Mr. Gaul; Executive Committee, Mr. Davis, Mr. McElvare, Mr. Teale, Mr. Naumann, Mr. Buchholz and Mr. Gaul.

A motion was made that a program committee was needed due to the fact that no mention of the meetings was entered in the Bulletin of the N. Y. Academy of Sciences, the motion was approved by the society. The program committee was nominated as follows: Mr. Sheridan, Chairman, Mr. McElvare and Mr. Teale.

Mr. Davis presented a case of egg masses of *Tenodera sinensis* and *T. angustipennis* and *Stagmomantis carolina*. Adults of these species were also shown. It is interesting to note that *T. angustipennis* has narrower wings than *T. sinensis*. Since both species are found together it was the opinion that the two species were only one. This has since been rectified. It is the first time that *T. angustipennis* has been found on Long Island.

Mr. Teale mentioned a very interesting visit with Phil Rau in Kirkwood, Mo.

The meeting was adjourned at 9:45 P.M.

JOHN WILLARD NOAKS, *Secretary pro tem.*

MEETING OF FEBRUARY 10, 1944.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on Feb. 10, 1944. The meeting was opened at 8:00 P.M. by President Wm. T. Davis. Members present were Messrs. Davis, McElvare, Naumann, Buchholz, Teale, Gaul, Noaks and nine visitors.

The minutes of the previous meeting were approved as read.

The Treasurer's report was accepted.

The speaker of the evening was Mr. Teale who told the Society about many interesting insect superstitions. Among those superstitions mentioned were the following:

A woodpecker's bill is supposed to prevent bee stings.

A doodle bug is supposed to point the way to lost cows.

A louse attached to the main mast of a ship is supposed to bring good luck. Mr. Teale mentioned many other entertaining notions about insects in all parts of the world.

The meeting adjourned at 10:00 P.M. after a general discussion period.

JOHN W. NOAKS, *Secretary, pro tem.*

MEETING OF APRIL 13, 1944.

The meeting opened at 8:10 P.M. with President Wm. T. Davis in the chair. Members present were: Davis, McElvare, Sheridan, Dietz, Buchholz, Naumann, and Teale. The Treasurer reported on the period from January 1, 1944, to March 31, 1944.

The paper of the evening was presented by Rowland R. McElvare. It dealt with "The Society as a Publisher of Entomological Literature for Sixty-Five Years." The early publications of the Society—which first started to publish in 1878—were passed around for the inspection of members. The first copy of the *Bulletin,* which appeared in May, 1878, had eight pages including one of advertisment. It was made possible through the fact that some of the members of the Society set the type. Discontinued as an independent publication in 1885, it was revived in 1912. *Entomologica Americana,* started in 1885, resulted from a combination of the *Bulletin* and the publication, *Papilio.* Examples of significant and interesting papers which appeared in early issues of the Society's publication were read by the speaker. The meeting adjourned at 9:55 P.M.

EDWIN WAY TEALE, *Secretary pro tem.*

MEETING OF MAY 11, 1944.

The meeting opened at 8:15 P.M. with President William T. Davis in the chair. Members present were: Davis, Naumann, Buchholz, Sheridan, Teale, Noaks, Nicolay and McElvare. Visitors included: Mrs. Teale, John L. Bull, Jr., and James Murphy.

The Treasurer made an informal report, covering the period from April 1, which was approved.

Mr. Teale reported observations on a spider with six eyes, living in a hole in decaying wood to which Hymenoptera came. He also read a letter from A. H. P. Wynne of Sinaloa, Mexico, about a mantis believed to be poisonous.

Mr. Davis called attention to the new volume of American Men of Science, including 34,000 names. He recalled that years ago the volume with 4,000 names was considered comprehensive.

Report of the Publication Committee was presented and approved.

Mr. Alan S. Nicolay then gave an interesting informal talk on collecting localities in this general area. Pointing out that he spoke from the point of view of a coleopterist, he contrasted conditions when he first collected in 1909 with the current situation so greatly different since the advent of the automobile.

Meeting adjourned 9:50 P.M.

ROWLAND R. MCELVARE, *Secretary pro tem.*

MEETING OF OCTOBER 11, 1944.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on October 11, 1944. The meeting was opened at 8:15 P.M. by Vice-President, Rowland R. McElvare. Members present were: McElvare, Naumann, Buchholz, Sheridan, and Noaks. The visitors included: Dr. and Mrs. Goodnight.

The minutes of April 13 and May 11 were approved as read. The Treasurer made a satisfactory report on the periods from April 1–June 30 and July 1–Sept. 30, 1944.

Those present sincerely sympathized with Mr. William T. Davis who is ill in the Staten Island General Hospital.

Dr. Goodnight was proposed for membership to the Society.

Mr. McElvare made a suggestion to the affect that the Society might make an award to the boy or girl who shows the most outstanding work in natural history. This topic was held for further discussion in coming meetings.

The summer experiences of members emphasized the poor collecting season.

Mr. Naumann mentioned that he took most of seventy caterpillars of *Anisota senatoria* and also six caterpillars of *Anisota virginiensis* both on oak.

Mr. Buchholz reported that he had found *Debis creola* (double brooded) for the first time in the state of Virginia. He also stated that *Problema bulenta* was fairly plentiful in Wilmington, North Carolina.

Mr. McElvare mentioned that he made an attempt to take *Schinia tuberculum* at Coram, Long Island, about one week before they had appeared in large numbers, consequently his trip was none too successful.

Mr. Noaks showed several specimens of *Anopheles punctipennis, Aëdes vexans,* and *Psorophora columbiae* collected in Flushing, Queens, this spring.

The meeting adjourned at 9:45 P.M.

JOHN W. NOAKS, *Secretary, pro tem.*

MEETING OF NOVEMBER 16, 1944.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on November 16, 1944.

The meeting was called to order at 8:15 P.M. by Vice-President R. R. McElvare. Members in attendance were: John Sheridan, Edwin W. Teale, Herman C. Moennich, John W. Noaks, A. T. Gaul, Otto Buchholz, and F. T. Naumann. Visitors included: Dr. George Becker, Mr. C. S. Tuthill and Mr. B. V. Wilson.

Minutes of the previous meeting were approved as read. A brief report of the Publication Committee was accepted.

The Treasurer submitted a brief resume of the finances of the Society. Mr. Teale reported a recent visit to Mr. Wm. T. Davis. He described his condition as not very much improved.

Dr. Clarence J. Goodnight came up for election to membership and was unanimously elected.

Mr. Noaks proposed Mr. Wilson for membership. The motion was made and passed that the by-laws be suspended and Mr. Wilson was unanimously elected.

Mr. McElvare showed a copy of "Life" illustrating various insect-borne diseases. Mr. Moennich spoke briefly about conditions on the West Coast.

The Program Committee made some changes so Mr. Moennich could address the Society at our next meeting.

The speaker of the evening was Mr. John W. Noaks who presented a discussion on "Some Current Research in Insect Physiology."

Following a general discussion period the meeting was adjourned at 10:00 P.M.

A. T. GAUL, *Secretary.*

EXCHANGES AND FOR SALE.

This page is limited to exchange notices and to small For Sale advertisements from members of the Society and from actual paid subscribers to the Bulletin exclusively. *Exchange notices* from members of the Society and from subscribers are limited to *three (3) lines each,* including address; beyond 3 lines, there will be a charge of $1.00 for each 3 lines or less additional. *For Sale* ads will be charged at $1.25 for each 3 lines or part of 3 lines. *Commercial or business* advertisements will not be carried in this page, but will go in our regular advertising pages at our regular advertising rates to *everybody.*

PENTATOMIDAE: Want to buy or exchange Pentatomidae from the United States and Mexico. Herbert Ruckes, College of the City of New York, 17 Lexington Ave. N.Y.C.

ACALYPTRATE DIPTERA OF THE WORLD wanted for determination or in exchange for other insects. Geo. Steyskal, 23341 Puritan Ave., Detroit, Mich.

LEPIDOPTERA COLLECTION.—Excellent condition, fine representation of named N. A. Diurnals and Nocturnals. Also choice selections of tropical Papilios, Sphingiids and Saturniids. Hy. J. Dietz, 3053 Hull Ave., New York, N. Y.

WANTED.—MANTID EGG CASES from West of the Mississippi River. If interested in collecting, write: Osmond P. Breland, The University of Texas, Austin, Texas.

WILL PURCHASE complete sets of the Bulletin, Old Series, Vols. 1–7, 1878–1885. Brooklyn Entomological Society, Ivy Way, Port Washington, L. I., N. Y.

LEPIDOPTERA AND ORTHOPTERA from Florida in papers and local specimens mounted to exchange for other Lepidoptera. —Alex K. Wyatt, 5842 N. Kirby Avenue, Chicago (30), Ill.

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Vol. XL OCTOBER, 1945 No. 4

BULLETIN

OF THE

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BULLETIN
OF THE
BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XL October, 1945 No. 4

THE GENUS TINOBREGMUS (HOMOPTERA-CICADELLIDAE) IN MEXICO.

By Dwight M. DeLong, Ohio State University,
Columbus, Ohio

The genus *Tinobregmus* was erected in 1894 by Van Duzee to include *vittatus* which he described from Florida. Three other species, *pallidus* Osborn, *invenustus* Lawson and *viridescens* DeLong, have been described since that time. Lawson reviewed and illustrated the North American species in 1932.[1] All of these species are southern in distribution, *viridescens,* which is associated with the deciduous forest, extends as far north as Missouri and Southern Illinois. The other species occurring in the United States are either coastal, desert or semidesert inhabitants.

Apparently no previous study has been made of the Mexican species of this genus. Collections from Mexico and Northern Guatemala have brought to light six species and one variety, all of which are new except one, *vittatus.* Most of the Mexican species occur on either the low or high desert. Two species, *macullelus* and *piperatus,* are found on the more luxuriant vegetation in the tropical areas.

Tinobregmus vittatus Van Duzee.

Tinobregmus vittatus V.D. Bul. Buf. Soc. Nat. Sci., 5: 214. 1894.

A large robust species with variable markings. Length, female 5–6.5 mm., male 4–4.5 mm.

The vertex is blunt, often angled, about one-fourth of which is produced beyond the anterior margins of the eyes.

Color: Females yellow marked with black and brown. Ver-

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[1] Lawson, P. B. The Genus Tinobregmus (Homoptera-Cicadellidae) Anns. Ent. Soc. Amer., 25: 359. 1932.

FEB 15 '46

tex usually with a pair of black spots at apex and a pair surrounding ocelli. Pronotum usually with six longitudinal dark stripes. Elytra variable in color. In well-colored specimens the veins are wide and pale and the cells between are some shade of brown. Face usually with two broad brown longitudinal stripes. Males usually black vertex marked with small light spots between the eyes. Pronotum yellow, lateral margins black. Elytra yellow with a black band across apex which is less than one-fourth the length of elytra. Face black. A few males resemble the females in color.

Genitalia: Female last ventral segment with posterior margin roundedly produced forming a lobe on median half. Male plates elongate and narrow.

This species has been collected in abundance along the border at both Laredo and Brownsville, Texas. It occurs on desert plants at low altitudes on both sides of the Rio Grande.

Tinobregmus vittatus var. **clavatus**, n. var.

Resembling *vittatus* in general form but with blunter vertex, shorter elytra, and heavier color markings. Length of female 6 mm.

Vertex similar to *vittatus* but more blunt, elytra short covering only a portion of the sixth segment.

Color similar to *vittatus,* except that the four longitudinal stripes on the pronotum are much broader and darker extending on to clavus and forming a solid dark brown clavus except for one light vein. The other cells of the elytra are also dark brown, the veins are pale.

Female last ventral segment almost truncate, posterior margin broadly, slightly produced.

Holotype female and paratype female collected at Fortin, Vera Cruz, October 9, 1941, by Caldwell, Good, Plummer and DeLong. These occur at an elevation of 2,500 feet and are on a rather luxuriant vegetation.

Tinobregmus brevis, n. sp.

Resembling *vittatus* in general form and appearance but shorter. Length, female 5 mm.; male 4 mm.

Vertex blunt, but slightly angled, more than four times as long as width at base and three times as broad at apex as at base. Elytra in female exposing seventh and eighth abdominal segments and last dorsal segment in male.

Color: Female pale with dark markings. Vertex with ocelli, a spot between them and a marginal spot in front of each, dark brown or black. Scutellum pale with four longitudinal stripes. Elytra mottled with brown, veins conspicuous. Male with vertex and face black, pronotum orange yellow with a black spot on each lateral margin. Elytra orange yellow, the basal fourth black, exposing tip of abdomen.

Genitalia: Female last ventral segment with posterior margin faintly concave either side of a median slightly produced lobe which appears to be slightly notched at center. Male plates very slender and elongate.

Holotype female, allotype male and male and female paratypes collected east of Saltillo, Coah.; elevation 5,000 feet, September 23, 1941, by Good, Caldwell and DeLong, from plants on the high desert.

Tinobregmus invicus, n. sp.

Resembling *vittatus* in general form but with distinct coloration. Length, female 6 mm.; male 5 mm.

Vertex blunt at apex, about three times as long as basal width between eyes, about twice as wide at apex as at base and produced a little before anterior margins of the eyes.

Color: Female yellow to pale brown. Vertex with a pair of black markings on anterior portion on the ocelli, a pair on middle and another at base. Pronotum pale with dark mottled spots. Elytra brown, veins pale, interrupted at short intervals by brown marks. A few black markings along commissure and apical portion darker. Male vertex pale with black spots similar to female. Pronotum and scutellum black with few pale markings. Elytra reddish brown with dark markings along commissure on apical half and apical fourth of elytra darker. Veins inconspicuous.

Genitalia: Female last ventral segment broadly roundedly produced with a slightly emarginate portion about half-way on either side of middle. Male plates long, slender, strap-like, appearing twisted at apex.

Holotype female, allotype male, and male and female paratypes collected at Ixmiguilpán, Hgo., elevation 5,730 feet, September 27, 1941, by Caldwell, Good and DeLong. Male and female paratypes collected at Tasquillo, Hgo., elevation 5,600 feet, October 29, 1941, by Good and DeLong. All were taken on high desert.

Tinobregmus maculellus, n. sp.

Resembling *viridescens* more closely in form but with distinct coloration. Length, female 6.5 mm.; male 5 mm.

Vertex produced and bluntly angled at apex, produced about one-third its length beyond the anterior margins of the eyes, about four times as long as basal width between eyes and twice as broad at apex as at base. Elytra long exposing only a portion of pygofer and the ovipositor in the female and longer than the abdomen in the male.

Color: Female pale gray mottled with brown and black. Vertex with a pair of elongate dark spots near apex and a similar pair on basal half. Pronotum pale with dark spots and elongated markings. Elytra pale, veins pale often crossed by dark markings. The corium, apical part and a portion of clavus mottled with dark brown or black. Male black and orange. The vertex, pronotum and scutellum are black. Elytra orange on anterior and costal portion. The commissure is broadly black and the apical third is black.

Genitalia: Female last ventral segment with posterior margin broadly roundedly produced and shallowly emarginate either side of median produced lobe. Male plates elongate, broadened at base then narrowed to a slightly broadened and curved apex.

Holotype female, allotype male, and male and female paratypes collected at Orizaba (K. 280), Vera Cruz, elevation 7,700 feet, October 17, 1941; paratypes of both sexes were also collected at Puebla, Pue., elevation 8,500 feet, October 18, 1941, by Good, Caldwell, Plummer and DeLong, and at Tehuacán, Pue., elevation 7,000 feet, October 17, 1941. This species has been taken only on high semi-desert.

Tinobregmus piperatus, n. sp.

Resembling *maculellus* in general form with vertex even more produced and black in color with minute pale spots. Length, female 6.5–7 mm.; male 5–5.5 mm.

Vertex blunt, produced about one-third its length before the anterior margins of the eyes. About four times as long as basal width and more than twice as broad at apex as basal width. Elytra long exceeding abdomen in both sexes, the ovipositor slightly exceeding elytra in the female.

Color: Female vertex black with a pale spot surrounding either ocellus, a broken white transverse band at anterior margin of the eyes and a pale stripe along either eye on basal portion. Pronotum black with seven or eight longitudinal pale stripes. Scutellum black with a pale longitudinal stripe just about half-way between median line and each lateral angle and a pale spot at apex. Elytra black rather uniformly marked with minute pale spots. Face black with a conspicuous white stripe along either eye. Genae white. Male black with few pale markings. The white band between anterior margins of eyes is faintly indicated and the white spots on elytra are abundant but less conspicuous than in the female. The pale line along eyes on face less conspicuous and the genae black.

Genitalia: Female last ventral segment with posterior margin rather strongly, roundedly produced on median half to form a lobe which is slightly notched at middle. Male plates long and slender, narrowed on apical half, then slightly enlarged at apex.

Holotype female, allotype male, and male paratypes collected at Fortín, Vera Cruz, elevation 2,500 feet, October 9, 1941. Paratype male collected at Orizaba, Vera Cruz, elevation 4,100 feet, October 8, 1941, by Plummer, Good, Caldwell and DeLong. All specimens were found on luxuriant vegetation.

Tinobregmus angustatus, n. sp.

Resembling *piperatus* in general form but with a more sharply angled vertex, an elongated slender body and a different coloration. Length, female 6 mm.; male 5.5 mm.

Vertex produced almost one-fourth its length before the anterior margins of the eyes and more than four times as long as basal width between the eyes. Elytra as long as ovipositor in female and longer than abdomen in male.

Color: Female dark brown with black markings. Vertex yellow with a median apical black spot and an angled black spot either side at anterior margins of the eyes. A pair of elongate brown spots also occur at about the middle between the eyes. Pronotum dark brown with eight pale longitudinal narrow stripes. Scutellum dark brown with basal angles darker, a pale line each side equidistant from each margin and from each other. Elytra brownish subhyaline, veins black, mottled with darker brown spots especially on clavus. Face dark brown with pale arcs, genae pale. Male almost entirely black in color. Vertex with a pair of transverse white spots at apex, an interrupted white transverse band just posterior to anterior margins of the eyes and a white line along either eye posterior to this band. Elytra with brownish streaks especially on the clavus.

Genitalia: Female last ventral segment with posterior margin produced on median half to form a median lobe. Male plates elongate, narrow, apical half more narrowed with a curved, enlarged apex.

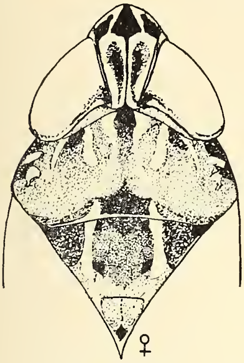
Holotype female, allotype male, and male paratype collected at Patulul, Guatemala, March 9, 1942, at an elevation of 1,200 feet by Dr. C. C. Plummer. Male paratype collected at Lake Petén, Guatemala, November 17, 1925, by Dr. Dampf (M.F. 809). No Mexican records are at hand but this species undoubtedly occurs in those states adjoining Guatemala.

Trichoptera Notes.—The following interesting and unusual records were called to the writer's attention by Dr. H. H. Ross, who identified the material: *Ochrotrichia stylata* (Ross), collected along the Sevier River near Circleville, Utah, July 10, 1943. Material collected in trap light and sweepings at Circleville at this time also included *Tascobia brustia* (Ross) and *Hydroptila argosa* Ross; the latter species also was collected at Provo, June 19, 1941. *Hydroptila arctica* Ross was taken at Provo, Utah, August 6, 1942, and Vernal, Utah, on June 27, 1943. *Leucotrichia limpia* Ross was taken at Hurricane, Utah, April 25, 1941. *Rhyacophylax signatus* (Banks) was collected by sweeping in large numbers of Trichoptera specimens which flew to the car headlights near Moab, Utah, and from sweeping *Salix* with an insect net, along the Colorado River after dark on the night of June 26, 1943.—G. F. KNOWLTON, Utah Agricultural Experiment Station, Logan, Utah.

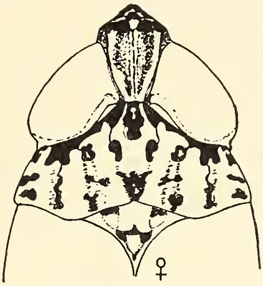
Eastern Record for California Tortoise-shell.—On September 4, 1945, I found on the shore of Lake Michigan, two miles north of Ludington, Michigan, four specimens of the California Tortoise-shell (*Nymphalis californica* Boisd.). They were wet, obviously having been recently washed ashore. One specimen was badly battered, two had several small nicks, and the last was in good condition. They were found several rods apart.

So far as we can discover, this type of butterfly has never been found east of the Rocky Mountains.—CLIFFORD BORAM, JR. (Age 11).

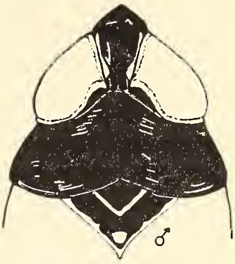
(A promising lad!—J. R. T.-B.)



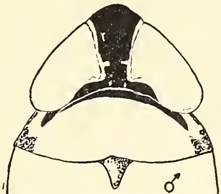
ANGUSTATUS ♀



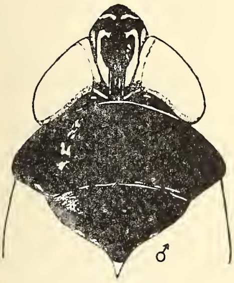
MACULELLUS ♀



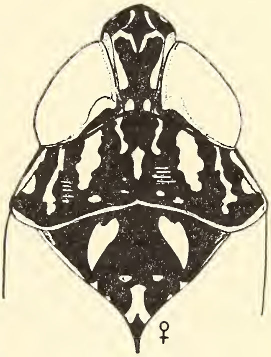
MACULELLUS ♂



BREVIS ♂



ANGUSTATUS ♂



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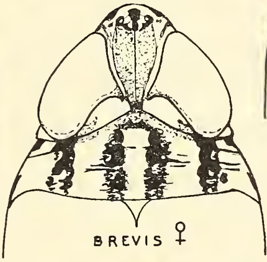
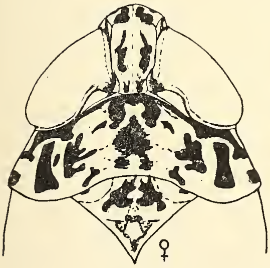
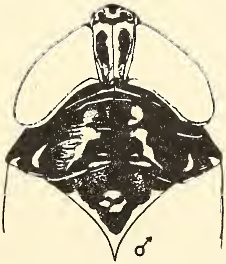


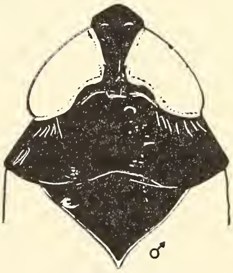
BREVIS ♀



INVICUS ♀



INVICUS ♂



PIPERATUS ♂

EXPLANATION OF PLATE.

Dorsal view of head, pronotum and scutellum of species as labeled showing color marking.

NOTES ON SOME DRAGONFLIES OF SOUTHWEST PENINSULAR FLORIDA.

By James G. Needham, Ithaca, N. Y.

After two winters spent on the lower gulf coast of Florida collecting dragonflies, I want to put on record some observations that I have made on a few of them. On that flat coastal plain, where open forests of slash pine once covered the drier soil and live oaks and palms still dominate the moister and richer soil in the low spots known as hammocks, there is permanent water only in the rivers, the lower reaches of the brooks and in a few of the larger ponds. In none of these is the water of any considerable depth. All the streams, as they near the sea, end in wide and sluggish estuaries of more or less brackish water. There are three types of environment that support the Odonate life of the region: ponds, streams, and the drainage ditches that have been made in the interests of agriculture.

The natural ponds in the pine flatwoods are very numerous, but most of them hold water only in the wet season, and so, are unsuited for dragonfly development. They are all more or less saucer-shaped, and few of them are of more than wading depth. On the higher ground about their borders there is generally a zone of saw palmettos. A zone of grass and other grass-like plants comes next, where the soil is always at least damp. Next comes a zone of arrowhead (*Sagittaria*) where the soil is nearly always saturated with water. Grass and arrowhead zones are often very wide. Their width varies with the gradient of the bottom. If deep enough at the center for open water, there may be patches of pickerel weed (*Pontederia*) or clumps of willow on the edges of it; and in the shoal water, massed polygonums or bonnets (*Nelumbo*), or scattered water lilies, partly floating; also such submerged aquatics as *Myriophyllum, Ceratophyllum, Chara* and *Utricularia.* In artificial ponds that have steeper banks, and in the edges of natural ponds where the water is deepened artificially, cat tails (*Typha*) come in and spread.

Ponds that are merely wet season pools yield no crop of dragonflies; and in this region of cattle pastures a good many that retain some water the year round are ruined for dragonfly production by the trampling of the bottom by the cattle.

Brackish water extends far up the mouths of streams. The salt content of the water varies with the distance from the gulf, with the drive of the tides, with the rainfall on the land, and with the gradient of the stream bed. All are wide and shallow, largely lacking in water weeds, and very poor in Odonate life, harboring in their edges only a few of the hardier all-season species such as *Erythrodiplax berenice, E. minuscula, Anax junius, Ischnura ramburii* and *Anomalagrion hastatum.*

The drainage ditches farther inland, that carry excess rainwater into the streams, are often extensive breeding grounds for dragonflies. These ditches vary in size and depth according to the area drained. Many of them are reduced to isolated residual pools in the dry winter season. In these pools small fish are concentrated. Many roadside ditches are trampled by cattle and hogs that run at large; and the reduction in numbers of dragonflies by the jaws of carnivorous fishes and by the trampling of hooves makes such pools very poor collecting grounds for nymphs.

In all the foregoing places, both fresh water and brackish, there are to be found a few hardy species, wherever there is proper cover: the five above-mentioned by name, and three additional that are by far the commonest and most characteristic of this region; *Pachydiplax longipennis, Erythemis simplicicollis* and *Argia fumipennis.* The big *Anax* seems to prefer beds of erect emergent aquatics; *Erythemis,* the submerged weed tangles. *Anomalagrion* nymphs live in seepage water amid the close-growing stems of small spikerushes and thin erect grasses.

It is not my purpose in this paper to chart the distribution in relation to habitat of the 40 species that I found during these two winters there, but only to record a few observations and experiences with three of them. However, I will first make mention of unexpected finds of four other species. I took a single half-grown nymph of *Aphylla williamsoni* from the soft black mud of a deep drainage ditch a few miles northeast of Englewood; also a single nymph of *Nasiaeschna pentacantha* from the mud of a smaller ditch near by.

I took a cast skin (an exuvia) of *Epicordulia regina* from the post of a highway bridge on Route U. S. 17 in Joshua Creek near Nocatee; and with the efficient help of Mr. William Hagener, I took a number of adults of this fine species as they skimmed over the slow-moving water of the creek near by. They were coursing low over the wider pools of the stream on more or less regular beats, and were not too difficult to catch. That was on May 4th. Heretofore I had seen this species only high in the air over open rivers.

I took *Perithemis seminole* from Trout Creek at bridge No. 6 on

Florida highway route No. 2 a few miles north of Olga. April 7th I got nymphs of this species from the water, exuviae from the stems of spider lilies that stood at the water's brink, and adults from the air. The only Odonate associate there, beside the ubiquitous *Pachydiplax longipennis,* was the pretty blue-lined *Argia sedula.* Trout Creek is a clear flowing sandy-bottomed stream of easy wading depth. It winds through deep oak woods.

I may mention incidentally that while plying my water net for *Perithemis,* I caught a number of small flat-fish (*achirus*) on the bed of this fresh-water stream.

Gynacantha nervosa.

This elusive species greeted me on my first evening at Englewood by flying about my head in an aisle in an orange grove. Its capture intrigued me. I had never caught one, nor even seen one alive before. Here it was, flying in what were to be my own haunts for an entire winter. I felt sure I would soon have a specimen; perhaps a good series.

There were two places where I could count on seeing a single *Gynacantha* flying at dusk on any clear calm evening in December: one was the above-mentioned lane through the orange grove; the other, a nearby apiary where it captured bees. I first tried the lane, and neatly missed an easy stroke at one that drifted near me. It kept on flying near me in the lane, soaring high, sweeping low, floating over my head, deliberately circling around my knees. Always my net, in close pursuit, would be a little bit too late.

When I failed to get it in the lane, I went over to the apiary and there was another one slowly floating along on the air in front of the hives. I slipped up on it and with a mighty stroke got it in my net. I took it out tenderly and was holding it by the legs when it bit me: gave me so sharp a nip with its jaws that my fingers relaxed for an instant; and I must have batted an eye, for it was gone so quickly and completely that I saw not a trace of it again; not even a vanishing shadow of it!

Then there came on a spell of very cold (near freezing) weather, and no more *Gynacanthas* were seen near at hand; but I kept on finding them through the winter, singly, in two warm hammocks several miles out of Englewood northward: two small islands of semitropic verdure, each set in a slight depression of the pine flatwoods. In each of these there was a heavy forest cover composed mainly of the crowns of very tall cabbage palms and wide-spreading live oaks. It was a cover that retained well the heat that the deep-black humus soil absorbs during hours of sunshine and it kept the nights warm. Both these hammocks were open stands of tall trees. Forest fires in former seasons had cleared them of underbrush. Even low hammocks will burn when enough dead palm leaves and other combustible materials have been accumulated, and a very dry season comes along. There was room enough under the cover for the sinuous flight of the *Gynacanthas* among the tree trunks.

I was able to visit these hammocks only about half a dozen times in all. Each time on entering I flushed a *Gynacantha* before I saw it. Each time I saw it in one flight only. It would fly waveringly around the periphery of the hammock at knee-to-head height. It would occasionally hover haltingly before openings in the surrounding wall of green vegetation. Then it would suddenly dash through one of the openings, not to be seen again.

My last chance of the season to get *Gynacantha* was in one of these hammocks: the one in which stands the big tree known as Hegener's Oak. It is a venerable live oak, about five feet in diameter, breast high. It is of very unusual form. I conjecture that it was overtopped and nearly crowded out in its youth: that it was able to push only two branches through the palm crowns above it, one eastward, the other westward; and that when these reached the light each developed enormously, its own way, gaining a spread of 100 feet or more. At any rate, it developed instead of the usual hemispheric live oak tree a high ∞-shaped crown at the top of a massive Y-shaped trunk.

The palms and a hackberry or two have crowded in around it, and under their combined canopy there is developed one of the most tropical spots that I have seen in Florida. It is a delightfully cool nook to enter, when coming in out of the hot May midday sun. In it I caught *Heliconia* butterflies, and a dagger-wing, and a very unusual hair-streak; also a large white-footed cranefly (*Oropeza*?).

I was standing with Mr. and Mrs. Hegener beside the big oak when Mr. Hegener discovered a pair of *Acanthagyna* hanging up by their feet on a twig of a nearby evergreen shrub *in copulo*. The shrub was small; the pair was well within its circumference and there appeared to be but one open passageway where they probably entered and where we expected they would go out again. Quickly we formed our strategy. I was to place the net over that opening; Mr. Hegener was to drive the pair into the net. Slowly, very slowly I moved the open net over the opening. Slowly Mr. Hegener approached the bush from the opposite side with his coat flaps spread out laterally like wings. Then the big rush ———! The net was empty; the bush was vacated, and none of us had had even a glimpse of the departing pair! So ended my efforts to catch *Gynacantha* that season.

The next season Mrs. Hegener took over. On January 10th, 1945, she appeared at the door of my study with a living *Gynacantha* in her hand, saying, "Would you care to have this specimen for your collection?" She had found it hung up by its feet under a projecting angle at the base of the building in which I was living, and only about a foot above the level of the ground; *and she had caught it with her fingers!* I was supposed to know how to catch dragonflies! My hat was off to Mrs. Gydde Jensen Hegener, my hostess and good friend.

This tawny-faced, thin-legged, gauzy-winged *Aeschnine* has in life a beauty of coloration that museum specimens have almost wholly lost. The green undertone of the front of the thorax, and the brighter green of the knobs at the wing bases and on all the prominences on the dorsum fade, and even the brown general ground color loses something of its softness. The eyes especially become lusterless. In life the ocelli are yellow. The very broad surface of the compound eyes (the area of the large facets) is dark brown; the lower part paler, with small blackish spots in three horizontal rows showing dimly through the transparent corneal layer.

This is indeed an interesting species: especially interesting for the fitness of its coloration for hanging up under cover by day and for flying only among the shadows of twilight.

Libellula needhami.

Nymphs of this species were often taken in the bottom mud of drainage ditches and at soft spots in the margins of ponds. They sprawl in the soft black mud. They are to be found by raking and sifting. Even after sifting they would be well-nigh undiscoverable amid the trash but for their habit of running to hide. They are generally so well plastered with mud that a preliminary washing is required before their specific structural characteres can be seen. I reared a number of them and have turned my reared material over to Mr. Minter J. Westfall, Jr., for description of the nymph. It has not hitherto been critically distinguished from closely related species.

Adults of this species were first seen by me on the wing on April 6th. On the shore of Lake Okechobee at Clewiston tenerals were then flying along with our two species of *Cannacria: C. gravida* and *C. herbida.* The first *Libellula* to transform in my rearing cages came out on April 19th. In the field they were becoming common from the end of May up to the time of my departure for the North in early June. I had seen no other species of *Libellula* in flight.

Macrodiplax balteata.

This tropical species has been reported from both the east and the west coasts of Florida, the nearest west coast station being Sanibel Island, off Ft. Myers, where Mr. M. J. Westfall, Jr., reported it as being common. I found nymphs of it about a hundred miles farther north at a pond in a dog race-track in the northeast corner of the city of Sarasota. This is an artificial pond made by widening and deepening a drainage ditch. It is something more than an acre in area, and of easy wading depth over most of that area. The bottom is sand. The water is very hard, somewhat sulphurous, but does not taste of salt. Except for a narrow open belt around the shoreline it is filled with a dense matted growth of Stonewort (*Chara*), with only a few tufts of ditchgrass (*Ruppia maritima*) interspersed. There was a scanty new growth of cattail (*Typha latifolia*) along one margin of the pond.

The nymphs were common in the matted chara. I could shake one out of almost every mass of it that I lifted from the water. Associated with them would occasionally be found a nymph of *Tramea* or a *Celithemis,* but these were few and far between. Nymphs of *Anax junius* were resident in the pond, but I found them only among the cattails near the shore; *Libellula needhami* nymphs also, but they were in the little mud-bottomed pockets at the margin.

It may well be that this surprising abundance of a tropical species so far north resulted from the chance coming of a windblown gravid female from the south. She could distribute her large burden of eggs well about on the surface of a pond that was not yet well stocked with enemies.

In all my aquatic collecting roundabout Sarasota in the spring of 1945 I found only a single nymph of *Macrodiplax* anywhere else than in this pond. That one came from a roadside ditch a few miles south of the city. It was taken from matted and partly submerged *Polygonum,* where there were many predacious waterbugs and beetles and a few nymphs of *Anax,* and of large *Libellulines.*

I described the nymph of this species in *Trans. Amer. Ent. Soc.,* 62: 111–112, 1936, jointly with Dr. Elizabeth Fisher. We had a single nymph taken near Wilson, Florida, from the stomach of a duck. Our figure (fig. 3 of Pl. VI) shows the lateral spines on abdominal segments 8 and 9 strongly incurved. That incurvature of them in our specimen was probably due to compression within the duck's stomach; for fresh specimens, while agreeing with our account of the nymph in other respects, show these spines directed straight to rearward. It has not yet been reared, but the venation of the nymphal wings is clear and the identification is certain.

Insects of Lupinus.—The longhorned beetle, *Anoplodera instabilis* (Hald.) (det. J. N. Knull) was conspicuously abundant upon blossoming parts of the common bluish *Lupinus laxiflorus* Dongl. which occurs among sage and forest on top of Beaver Mountain, Utah, near Big Flat. Thirty specimens were collected in 15 minutes, one to three beetles occurring on blossoms of some plants in the sunny spots along the edge of the highway; these beetles were scarce on shaded *Lupinus* plants. Whenever beetles were dropped while being collected, or purposely dropped to watch their reactions, none attempted to fly; each immediately began to burrow among the leaves or rubble on the ground, usually getting out of sight within 20 to 30 seconds. Leaves above the beetles were agitated for 50 to 68 seconds. Sometimes a buzzing noise was made by the beetles when they were dropped. Beetles attempted to bite the collector when picked up with the hand; they hung tenaciously to the fingers when being placed in 1 × 8 inch pocket cyanide tubes. (Observations were made between 5:30 and 6:15 P.M. Mountain War Time.)

Other insects observed at this stop, on *Lupinus,* included a number of *Macrosiphum albifrons* Essig. One immature female of this aphid species was observed while being fed upon by a damsel bug, *Nabis roseipennis* Reuter. This predator dragged its prey into the cyanide bottle when captured.—G. F. Knowlton, Utah Agricultural Experiment Station, Logan, Utah.

DR. LUIS VARGAS ON AMERICAN BLACK-FLIES —A REVIEW, WITH CRITICAL NOTES (DIPTERA).

By J. Bequaert, Museum of Comparative Zoölogy,
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Simúlidos del Nuevo Mundo. By Luis Vargas. (Monografía No. 1 of the Instituto de Salubridad y Enfermedades Tropicales, México, D.F. 1945.) vi + 241 pp.

The black-flies, or members of the family Simuliidae, are among the smallest of the blood-sucking Diptera, only a few species reaching one-fifth of an inch in length. Yet, owing to their large numbers and voracity, they rank among the most vicious pests of animals and man. In recent years interest in these insects has become more general, particularly because of their rôle in the transmission of human onchocerciasis. This disease, caused by a roundworm, *Onchocerca volvulus,* frequently induces partial or total blindness and is prevalent in parts of Tropical Africa, as well as in the prosperous coffee-growing districts of southern Mexico and Guatemala.

As the proposed Pan-American Highway traverses the infected area, there is real danger of the disease spreading to new territory, where black-flies are common but as yet free of infection. The Governments of Mexico and Guatemala are fully aware of the risk and are actively engaged in studying and combating the disease and its vectors. Dr. Luis Vargas, as the Mexican member of the Inter-American Committee for the Control of Onchocerciasis, has had considerable experience and is well qualified to present a comprehensive account of these insects. His Monograph is a well conceived and fully reliable guide for American students of the Simuliidae. About one-fourth of it is devoted to general topics, namely, the economic importance, particularly in relation to the health of man and animals, the external and internal morphology of the adult, the habits of the adults, oviposition, larval morphology, the bionomics of the early stages, the life span, rearing methods, and the various parasitic and predacious enemies. In addition to a digest of published data, these chapters include some new observations by the author and his Mexican associates. The excellent illustrations, many of them original, add greatly to the value of this account.

The remainder of the book is devoted to the taxonomy of the family. It starts with a critical study of various systems of classification proposed in recent years. To the taxonomist the Simuliidae present a rather unusual problem. To begin with, the family is sharply delimited, there being none of the annectant forms which only too often blur the dividing lines between the major groups of Diptera. The general morphology is unusually uniform at all stages, no doubt because the adult and larval habits are much the same throughout the family. The females of all species are obligate blood-suckers, so far as known, and the early stages are always rheophilous, that is, adapted to living immersed in swiftly flowing water. In addition, the species and races are relatively few, not more than about 600 having been recognized thus far. Finally, the specific characters of the adults are inconspicuous and are scarcely ever adaptive modifications of some more generalized structures. This latter peculiarity makes it difficult to define truly natural groups of species, corresponding to definite evolutionary trends.

In recent years Enderlein attempted to build up an ambitious "System" which divides the family into 7 subfamilies (some of these with a number of tribes) and 47 genera. Many of his genera are clearly based on artificial combinations of relatively unimportant features. Hence the reluctance of his contemporaries to accept his classification, most recent students being content to include all black-flies in the one genus *Simulium*. Nevertheless, it would seem that some of Enderlein's divisions are natural groups, as much entitled to generic rank as similar groups generally treated as genera in other families of Diptera. Some future student will have the difficult task of clarifying the taxonomy of the family. He will be greatly helped by Dr. Vargas' compilation of the supraspecific names proposed thus far. There appears to be no important omission in this part of the work. Perhaps the generic name *Simulia* Meigen (1818, Syst. Beschreib. Europ. Zweifl. Ins., 1, p. 289) should have been included. It was presumably an emendation of *Simulium* Latreille (1802), but it was also used by some later writers, notably by Zetterstedt.

It might be useful to note two generic names proposed for fossil flies, at one time believed to be Simuliidae. *Pseudosimulium* Handlirsch (1906, Die Fossilen Insekten, pt. 4, p. 631) was proposed for the fossil *Simulium* (?) *humidum* Brodie (1845) which is not a true black-fly. The name antedates *Pseudosimulium* Baranov, 1926, proposed for Recent species. *Simulidium* Westwood (1854, Quart. Jl. Geol. Soc., 10, p. 394) was based on *Simulidium priscum* Westwood, one of the Bibionidae, according to Handlirsch.

In this connection, it may be mentioned that a few fossil true

Simuliidae are known, all from the Oligocene and mostly from Baltic amber. These extinct forms seem to be essentially like the Recent members of the family.

About half of Dr. Vargas' Monograph consists of a Catalogue of the 227 New World species and subspecies, in alphabetical sequence, with their synonyms and complete references to the literature. As the author includes all species in one genus, *Simulium,* he was obliged to propose new specific names when the same name had been used more than once by previous writers. Unfortunately, Dr. John Smart, of the British Museum, made similar changes in the nomenclature while Dr. Vargas' Monograph was being published. I have thought it useful to point out how this will affect the nomenclature of the American species. I have added some other comments and a few additions.

Simulium aequatoriense should be credited to Vargas, 1945, as Enderlein did not use that form of the name. Moreover, it is in my opinion an unnecessary emendation of *ecuadoriensis* Enderlein, 1934. Both forms of the specific name are acceptable according to the rules.

Simulium angustifrons (Enderlein, 1934). The species was named *Simulium lurybayae* by Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132, because of the earlier *Nevermannia angustifrons* Enderlein, 1921, if the latter is transferred to *Simulium.*

Simulium chalcocomense should be credited to Vargas, 1945, not to Knab. It is, moreover, a superfluous emendation of *Simulium chalcocoma* Knab, 1914, a specific name which is correctly formed.

Under *Simulium chilianum* Rondani, the reference to *Simulium chilense* Philippi, 1865, should be deleted, as both are listed as distinct species in the Catalogue.

Simulium coffeae Vargas dates from 1945, Rev. Med. Trop. Paras. Habana, 11, p. 4. It was proposed unnecessarily as a new name for *Friesia falculata* Enderlein, 1929, which is not a homonym of *Wilhelmia falcula* Enderlein, 1921, even when both species are transferred to *Simulium.*

Simulium costarricense Vargas, 1945, Rev. Med. Trop. Paras. Habana, 11, p. 5, is antedated by *Simulium costaricense* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132. Both names were proposed for *Acropogon rufidorsum* Enderlein, 1936.

Simulium glaucophthalmicum should be credited to Vargas, 1945, not to Knab. Whether or not this emendation of *Simulium glaucophthalmum* Knab, 1914, was necessary is a matter of opinion.

Simulium incaicum Vargas, 1945, Rev. Med. Trop. Paras.

Habana, 11, p. 4, is antedated by *Simulium sicuani* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132. Both names were proposed for *Ectemnaspis limbata* Enderlein, 1934.

Simulium paynei Vargas, 1942, has as synonym *Simulium bilimekae* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 132. Both names were proposed for *Hemicnetha mexicana* Enderlein, 1945.

Simulium simile Silva Figueroa, 1917, has as synonym *Simulium figueroa* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 133. Smart proposed this new name unnecessarily, as there is no *Simulium simile* Malloch, 1914 (Malloch's name dates from 1919).

Simulium venustum var. *infuscata* Ad. Lutz, 1909, and *Simulium infuscatum* Ad. Lutz, 1910, are two distinct species according to Ad. Lutz, 1917, Mem. Inst. Osw. Cruz, 9, p. 62. If this is true, the second in date will have to be renamed.

The following species should be deleted from the American Catalogue: *Simulium neireti* Roubaud, 1905, Bull. Mus. Paris, 11, p. 425. Originally described from Madagascar, it was recorded by Enderlein (1936) from Natal and Pretoria in South Africa.

The following American species were omitted from the Catalogue:

Simulium groenlandicum Enderlein, 1935, Sitzungsber. Ges. Naturf. Fr. Berlin, for 1934, p. 363. Greenland.

Psilozia groenlandica Enderlein, 1936, Sitzungsber. Ges. Naturf. Fr. Berlin, for 1936, p. 114. This was renamed *Simulium asakakae* Smart, 1944, Proc. Ent. Soc. London, Ser. B, 13, p. 131. Greenland.

Simulia hematophila Laboulbène, 1882, Archives Médecine Navale, 38, p. 223, from Newfoundland, has been overlooked by all subsequent writers. Although described and clearly recognizable as one of the Simuliidae, it is perhaps only a hypothetical species, as Laboulbène saw no specimen. He wrote his description from notes made in the field by E. Treille (1882, *op. cit.*, p. 221), as well as from some unpublished sketches. This is said to be a very troublesome blood-sucker in Newfoundland and should be easily recognized from the description.

In a taxonomic Catalogue special attention should be paid to tracing the actual first date of publication of all names, so as to ensure the correct application of the rules of nomenclature. Dr. Vargas' dates are generally correct; but in a very few cases he was evidently unable to reach a decision. It may be helpful to complete his indications.

Simulium fulvum Coquillett, *S. glaucum* Coquillett and *S. vir-*

gatum Coquillett date, not from 1903, but from September 12, 1902, the date given for Coquillett's paper in the Table of Contents of vol. 25 of Proc. U. S. Nat. Mus.

Simulium molestum Harris was first published, with a description, in 1841, Report Insects Massachusetts Injurious to Vegetation, p. 405 (not in 1862). No locality was mentioned, but the types, in the Harris Collection now at the Museum of Comparative Zoölogy, are labelled "White Mountains, New Hampshire." The *Simulium nocivum,* also briefly described by Harris in 1841 (*op. cit.,* p. 405), is from the description a *Culicoides.* Both specific names are omitted from Sherborn's Index Animalium, although they are validly proposed. Compare C. W. Johnson's notes on the Harris Collection (1925, Proc. Boston Soc. Nat. Hist., 38, No. 2, pp. 62 and 65).

Simulium venustum Say dates from 1823 (not 1827).

Simulia vittata Zetterstedt was published in 1838 (not 1835, 1839, 1840, or 1844). The "Insecta Lapponica Descripta" appeared from 1837 to 1840, the title page, issued after completion of the work, bearing only the date 1840; but the part containing p. 803 was published in 1838. Moreover, the type locality was Greenland, the only locality definitely given. Lapland was added only with doubt.

Simulium nigrimana Macquart dates from 1838 (not 1837), both the original in Mém. Soc. R. Sci. Agric. Arts Lille (for 1838), pt. 2, p. 88, and the reprint, Diptères Exot. Nouv. Peu Connus, vol. 1, pt. 1, p. 84, being published that year. *Simulium tarsatum* Macquart was first published in 1845, Mém. Soc. R. Sci. Agric. Arts Lille (for 1844), p. 148. The reprint, "Diptères Exotiques Nouveaux ou peu Connus, Supplément I," which Dr. Vargas quotes (as p. 20), is dated 1846 on the title page.

All references to Enderlein's paper in the Deutsche Entom. Zeitschr. for 1933, pp. 273–292, should be dated as of 1934. Parts 2–3 of this volume appeared in February, 1934, as printed on the cover.

The extremely useful Index and the very full bibliography, which conclude Dr. Vargas' Monograph, are particularly to be commended.

REVIEW OF THE GENUS SALDOIDA WITH NEW RECORDS FOR GEORGIA AND VIRGINIA (HEMIPTERA, SALDIDAE).

By Robert L. Usinger, Atlanta, Georgia.

Shore bugs of the genus *Saldoida* Osborn were first discovered in Florida by Mrs. A. T. Slosson and were described by Herbert Osborn (1901). Mrs. Slosson found two species associated with ants and reported her interesting observations in 1908. Reuter (1912) made a separate subfamily for this small group. Whether or not subfamily status is justifiable, these are certainly the most remarkable of all Saldidae thus far described. Horvath (1911) and Poppius (1914) extended the range of the group to Formosa and the Philippines, describing species which are even more bizarre than the Florida forms.

Subsequent collections by Wiley (Hungerford, 1922) in Texas, Blatchley (1926) in Florida and by H. S. Barber in Virginia and myself in Georgia (see below) show that these bugs are extremely variable as regards color and degree of development of the wings and pronotal spines. There are two macropterous specimens in the United States National Museum, one of *cornuta* from Biscayne Bay, Florida, and one of *slossoni* from Coronado Beach, Florida. My specimen from a stream at Stone Mountain, near Atlanta, Georgia, is brachypterous and is considerably darker than most *slossoni* with the last two antennal segments entirely black. There are two brachypterous specimens of *cornuta* from Bellaire, Florida, with distinctly produced humeral spines whereas the humeri are scarcely produced in the macropterous specimen from Biscayne Bay. Hungerford (1922) proposed a varietal name, *wileyi,* for a Texas form but the characters mentioned seem to fall within the limits of variation seen in specimens of *slossoni* along the East Coast.

There is a single specimen of the Philippine *Saldoida bakeri* Bergroth in the National Museum. This specimen is from Mt. Makiling, Luzon, P. I., and is a part of the Baker collection. Since Mt. Makiling is at Los Baños it is assumed that this specimen is topotypic. Bergroth does not mention the raised, almost keeled commissure of the clavus which is very conspicuous in the National Museum specimen.

Key to the Species of Saldoida.

1. Pronotal spines nearly twice as long, measured in side view from lateral margins of pronotum, as depth of prothoracic collar,

the distal halves slender, bent backward, with apices acute. Oriental 2

–. Pronotal spines shorter than depth of prothoracic collar, evenly tapering to subacute apices, not slender and backwardly directed apically. American 3

2. Antennae in female with second segment three-fourths longer than first, the third slightly longer than second, the fourth equal in length to the second. Formosa . . . . *Saldoida armata* Horváth

–. Antennae in female with second segment almost twice as long as first, third one-third longer than second, fourth one-sixth longer than second. Philippine Islands . . . . *Saldoida bakeri* Poppius

3. Anterior lobe of pronotum and spines black, clothed with appressed white pubescence. Humeri more or less strongly produced into elevated, subacute spines. Scutellum black with appressed pubescence, the disk only slightly elevated apically. Biscayne Bay, Bellaire, Punta Gorda, and Dunedin, Florida . . . . *Saldoida cornuta* Osborn

–. Anterior lobe of pronotum and spines ochraceous to fulvous or even darker but with the spines glabrous except for a few stiff black hairs. Humeri scarcely produced, rounded. Disk of scutellum strongly inflated apically. Punta Gorda; Bellaire; Coronado Beach, Febr. 26, 1939 (C. A. Frost); Stone Mtn., near Atlanta, Georgia, July 1944 (R. L. Usinger); Lake Drummond, Dismal Swamp, Virginia, Sept. 1, 1930 (H. S. Barber); and Big Sandy Creek, Eastland Co., Texas, June 18, 1921 (Grace Wiley) . . . . *Saldoida slossoni* Osborn

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ENTOMOLOGICA AMERICANA

Notice to Subscribers

We are receiving inquiries about the missing numbers of Entomologica Americana for 1945. This is the answer to all such questions, expressed or implied.

This, our monographic journal, is suffering from the belated consequences of the war now happily over. No manuscripts have come in which are in keeping with our general policy of publication for it. This is because the younger entomologists either have been sucked into the army or the war activities in some form; or, as the older entomologists, are badly overburdened with extraordinary and added labors. This excess of work has left no time for anything beyond it. The condition is prevalent everywhere, as we repeatedly hear from our correspondents and contributors.

Meantime, the outlook for 1946 seems promising; and we believe that we shall be running on a regular schedule and caught up with arrears during that year.

We ask our subscribers to be patient, for our present belatedness is from conditions we cannot remedy or control ourselves; time only will regularize them.

The Publication Committee,
Brooklyn Entomological Society.

ENTOMOLOGICAL TRIVIALITIES.

By Phil Rau, Kirkwood, Mo.

IV.

Insects and Will-Making.

It is not often that insects figure in the making of wills. This rarity obviously is due to the fact that only a very few individuals of the world's various populations have been sufficiently interested in them to have collections worthy of bequest.

An unusual will, in which insects played an important part, was made in the early days of the Nineteenth Century by one Nicholas Gimcrack. This appeared originally in "Tatler" (Vol. 4, No. 216), and is appended to an essay on "Will-Making" by William Hazlitt (1778–1830). It is used by him as one of several examples to show "the stupidity of human character."

Thinking that present-day entomologists would be interested in knowing what men collected 150 years ago, I have selected a few passages from the will of this ardent collector:

> To my dear wife,
> One box of Butterflies,
> One Drawer of Shells.
> To my Daughter Elizabeth,
> My Receipt for preserving dead caterpillars.
> To my Nephew Isaac,
> A horned Scaraboeus.
> To my Eldest Brother,
> My last years collection of Grasshoppers.
> To my Second Son Charles, I give and bequeath all my Flowers, Plants, Minerals, Pebbles, Fossils, Beetles, Butterflies, Caterpillars, Grasshoppers and Vermin not above specified.

He collected not only insects but also other objects of natural history besides those enumerated above. He was an ardent collector of the kind one rarely sees in private life today, and evidently a very lonely man. Hazlitt, of course, is not interested in what, or how or why or where, the man collected, or whether or not he had friends to share his interests. It is his business to show in this essay that in the light of the revealing of human nature, will-making "is the latest opportunity we have of exercising the natural perversity of our dispositions," and he uses this as an example because the man bequeathed to some people whom he disliked the very objects of their hatred.

In this subtle posthumous revenge Hazlitt can see only a "perverse disposition," for he says: "Crimes, loathsome vices, may go unchecked, but it is the laughing at our weaknesses, or the thwarting of our humors, that is never to be forgotten."

INSECTS AND POETRY.

Probably nearly all the verses about insects that had been written up to the time of C. V. Riley's entomological activities have been used by him in one place or another in his "Nine Missouri Reports." He used verse profusely in all his writings, and I am sure they were the better for it.

Since that time a new crop of verse on or about insects has sprung up. Little of this, however, is really outstanding, and most of it is bad entomology. There is one exception, however, and they are the verses about insects to be found in "The Collected Poems of Robert Frost." Here a wide variety of insects are represented in good poetry and generally in good entomology. Here are the titles: "My Butterfly," "Blue Butterfly Day," "Fireflies in the Garden," "The Cocoon," "The White-tailed Hornet," "Departmental, or the End of My Ant Jerry," "Design," "Waspish," and a short one with the title, "One Guess," which runs:

"He has dust in his eyes, and a fan for a wing,
A leg akimbo with which he can sing,
And a mouthful of dye-stuff instead of a sting."

NOTE ON CEROTOMA AND ANDRECTOR (COLEOPTERA, CHRYSOMELIDAE).

By H. S. Barber, Washington, D. C.

Numerous lots of *Andrector* found injuring beans in Florida, Texas, and Arizona, and others submitted to me for identification from Central America and the West Indies show the need of a short note to correct misconceptions on identities and on nomenclature.

The generic name *Cerotoma* was proposed by Chevrolat, 1837, in the Dejean Catalogue (see Barber and Bridwell, 1940, Brooklyn Ent. Soc. Bul., vol. 35, pp. 1–12) to include 18 species, of which several were then without valid names while others had been described by Fabricius, Olivier, Latreille, etc., and are now referable to 5 genera, *Aulacophora, Diabrotica, Neobrotica, Cerotoma,* and *Andrector.* Selection and designation of 1 of these species, *Crioceris caminea* F., 1801, as genotype of *Cerotoma* by Chapuis, 1875 (*in* Lacordaire, Genera des Coleopteres, vol. 11, p. 230) is not invalidated by reason of the description given by Chevrolat, 1842 (*in* D'Orbigny, Dict. Univ. Hist. Nat., vol. 2, p. 420) which includes the characters of the male antennae of certain species now assignable in *Andrector* but not shown by the genotype. Leng, 1920 (Cat. Coleoptera Amer. N. of Mexico, p. 298), adopted this result, but in the quarter-century since then confused usage, together with misapplication of the specific name *ruficornis* to the bean pest in Arizona, requires notice. Weise, 1924 (Junk, Coleopt. Cat., pars 78, pp. 137–139), reunited *Andrector* and *Cerotoma,* listing 32 species and 10 synonyms or subspecies (1 species, *laeta* (F.), seems assignable in *Diabrotica*). A correct analysis of the numerous neotropical forms must await evidence not now available, but a few facts which now seem to be clear should be noted.

The color pattern is probably ancestral, since its intermediate expression is very similar in several different species, but in several of the species and in certain regions this pattern varies to obliteration either by reduction of the infuscation to almost entirely pallid elytra or by increase of markings into almost entirely black wing covers. The shores of the Caribbean seem to be the home of several similar species distinguishable in the males by characters hitherto not recorded, i.e., slight differences in the clypeal prominences and depressions of the male head. In these details the Texan *sexpunctatus,* the genotype of *Andrector,* seems to agree with, and to be only a local expression of, the Antillean species *ruficornis* Oliv., 1791 of which *denticornis* F., 1792, appears correctly listed as a synonym, which has been found attacking leaves and pods of lima beans at Princeton, Fla., March 31, 1944, while the Arizonan species, which has been misidentified as *ruficornis,* displays a different clypeal form and a shorter, broader aedeagus indistinguishable in these characters from Guatemalan samples of a serious bean pest which I have identified as *atrofasciatus* Jac. Thus, the synonymy of the three species which attack bean plants in the United States seems to be as follows:

Cerotoma Chevrolat, 1837 (*in* Dejean Cat., revised, p. 403). Genotype, *Crioceris caminea* F., 1801, designated by Chapuis, 1875.
    trifurcata (Forster, 1771—29), Eastern States.
        caminia (F., 1801—459).
Andrector Horn, 1872—152. Genotype, *A. sexpunctatus* Horn, 1872—152, monobasic.
  Cerotoma auct. (part).
    ruficornis (Olivier, 1791—200), West Indies, Florida, Texas.
        denticornis (Fabricius, 1792—24), West Indies.
        sexpunctatus Horn, 1872—152, Texas.
    atrofasciatus (Jacoby, 1879—792), Central America, Arizona.
        ruficornis auct. not Oliv.

In *Cerotoma* the antennae and front show no sexual differences. In males of *Andrector* the clypeus is deeply excavated and acutely ridged, and antennal joints 3 and 4 are conspicuously enlarged and modified into what appears to be a grasping organ.

TAXONOMIC TYPE NAMES AND IDENTIFICATION TERMS USED FOR IMMATURE INSECTS.[1]

By Wm. P. Hayes, Urbana, Ill.

Article 47 of the Entomological Code of Banks and Caudell states that "A specific name given to any part . . . or stage (except egg) of an insect is valid if otherwise available." It is further indicated in Article 48 that "A specific name based wholly on a cocoon, case, gall, leaf-mine, or other work of an insect is valid, if otherwise available, only until the insect itself is described, when that name and authority replaces the one based on the work." Although insects are now only rarely described from their immature stages it has been done to some extent in the past. Because of this there are many collections with specimens of such described insects. These, accordingly, represent type material. Few are aware that methods of designating such types are available.

The term *nepionic* (Gr. *nepios*—an infant) is defined in Torre-Bueno's Glossary of Entomology as "that stage of development immediately succeeding the embryonic; proposed as a substitute for larval." By this definition, it is obvious that the term must apply to both larvae and nymphs and precludes the pupal stage. From this term, we have had proposed by Alexander (1920, Cornell Memoir, 38: 743) the word *nepionotype* to designate a type larva. Although this type designation is not included in Torre-Bueno's glossary, it does occur in Fernald's (1939, Ann. Ent. Soc. Amer., 32: 697) list of type names which was compiled for him by Alexander. Also in Torre-Bueno's glossary the term *neanic* (Gr. *nearos*—youthful) is defined as "referring to the pupal stage." From this word there has also been derived the term *neanotype,* proposed by Alexander (*l.c.*), to refer to the type of a species described from a pupa. Fernald's list (*l.c.*) includes the name *ootype* of which it is pointed out that it is preoccupied as a morphological term in tapeworm nomenclature but which theoretically should be the type of an animal described from an egg. For the designation of an egg type this list indicates that such terms as *ovotype, ovoholotype* and *ovoparatype* can be used to designate type eggs.

Hopkins (1936, Mosquitoes of the Ethiopian Region, Vol. 1, p. 26) proposed the use of the term *paedotype* from the Latin *paedo* meaning child. He defines it as follows: "Paedotype is the type of any of the immature stages of an insect. It consists of the larva or pupa, of the larval or pupal skin, together with the adult insect bred from the same individual larva or pupa, in the case of the egg it may be either the whole egg together with the female which laid it, or the egg shell and the adult bred from it." Hopkins continues, "It will, of course, commonly happen that egg, larva and pupa are described at different times, in such cases there should be one paedotype for each stage. It is suggested that paedotypes should be indicated by a small circular green label attached to the specimen of each of the stages which make up the paedotype, and that this label should be inscribed to indicate whether the paedotype is of egg, larva or pupa. When possible, it is, of course, desirable to make the same adult serve as part of the paedotype for more than one of the early stages and it is clearly desirable that this adult should belong to the sex which is most readily identifiable. *Neo-paedotypes* may be designated when the original of an early stage was not made from material procured by the isolation method, or when it is no longer possible to associate the larval or pupal skin with the adult bred from it."

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[1] Contribution No. 245 from the Entomological Laboratories of the University of Illinois, Urbana, Illinois.

From these two sets of terms we see that they both have their uses. A *paedotype* is not as specific in meaning since it may be used for either larva, pupa or even an egg and should have an adult associated with it. However, it is only rarely or never that an insect species is described from an egg. When using paedotype, it seems necessary, from Hopkins definition, to use a qualifying adjective to indicate whether the type is an egg paedotype, a larval paedotype or a pupal paedotype. The terms nepionotype and neanotype are more specific and if species must be described from immature forms the *neanotype* will definitely indicate a pupal type. Since there is no way of distinguishing a larval type from a type that is described from a nymph the term *nymphotype* is here suggested for species that have paurometabolic development.

Fernald's type list (*l.c.*) cites 108 terms used in the designation of types. Many are synonyms. Commenting on the matter he writes that "entomologists may find themselves buried in a chaos of this phase of terminology." Pertinent to the naming of types for immature insects he further comments, "with two exceptions (meaning nepionotype and neanotype) all these terms relate in some way to the adult except possibly in palaeontology. But Pandora's box has many more which may escape. At any time some worker may describe the hitherto unknown egg and mark it some kind of type: equally, newly described specimens of naiads in each of their many instars (45 or more in some species), nymphs, larvae and subimagos may become the bearers of different kinds of type names. There is no rule to prevent this. This enormous number of naiad, nymph and larval instars available insofar as none of them have previously been described, needs only a few workers with the "mihi itch" to deluge the nomenclatural field with a flood of new type names." He further mentions the possibilities of new type names with the discovery of such things as new leaf-mines and new insect galls. He overlooked cocoons, cases, callows, pronymphs, castes and a host of other possibilities. These obviously must be described but whether type designations are necessary is questionable to the present writer even though he has become infected with the "mihi itch" in his proposal above of the term *nymphotype*. Obviously, he needs a good dusting with DDT before the itch becomes severe.

In the matter of labeling immature specimens to indicate their status as to the manner in which they were determined, Van Emden (1922, Ent. Jahrb. for 1923, p. 102) suggested certain designations to be used on labels and later (1942, Tr. Roy. Ent. Soc., Lond., 92: 6) further discussed the subject. Since eggs, larvae, pupae and nymphs may be determined in a number of ways, an indication of the *manner of determination* should be noted on the identification label. This will give some notion as to the reliability of determination. Obviously, the most reliable method is to rear the immature form to the adult stage and then identify it. This procedure is time-consuming and often results disastrously when specimens die before they reach maturity.

The starting point in such rearings can begin at one of the several life stages. If a known adult is allowed to lay eggs the resulting larvae and pupae (or nymphs) are thus associated with the known adult. For specimens thus bred, Van Emden suggested the term *"determinato ex ovipostione"* which can be abbreviated *det. ex ovip.* Specimens that are reared from unknown nymphs or larvae to adult and then determined may be designated *"determinatio ex evolutione imaginis"* (*det. ex evol. imag.*) This method requires individual rearing because of the danger of having immature cultures that might be mixed; that is, composed of more than one species. Often characters of an adult may be recognizable in the pupa. Hayes and McColloch (1920, Ann. Ent. Soc. Amer., 13: 77) showed that in late pupal life the genitalia of adult beetles of the scarabaeid genus *Phyllophaga* (*Lachnosterna*) can be recognized through the pupal integument. Larval exuviae associated with such pupae can thus be identified by their genitalia and often by other structural pupal characters that are common to the adult. For the designation of such larvae, Van Emden would use the phrase *"determinatio ex futura imagine"* (*det. ex fut. imag.*). Ross (1944, Bull. Ill. Nat. Hist. Survey, Vol. 23, p. 17) has recently made extensive use of this method of determination for both larvae and adults of Trichoptera. He speaks of it as "association by pupal dissection" and comments as follows: "In all caddis fly groups the larval sclerites are packed into the posterior end of the pupal chamber after the pupa is formed. Later in pupal life the adult structures take definite form within the pupal skin, and just before actual escape of the pupa, the complete adult may be teased out of the pupal skin. Such pre-adult specimens show all adult characters except those of wing venation . . . of greatest importance is the fact that the genitalia of both sexes become completely formed, hardened and colored before emergence of the adult."

"If, then, a cocoon or case is collected which has a mature pupa in it, the larval sclerites and fully formed genitalia are associated, and it is possible thus to link the adult and larval forms of the species." He points out that Vorhies (1909) and Milne (1938) have also used this method of association. Ross also states that while it may be necessary sometimes to make repeated collections in an area before certain species can be associated, he has found it "more satisfactory than cage rearing because of extreme cannibalism developed by caged larvae."

As we gradually increase our knowledge of the taxonomy of immature insects, more keys and descriptions become available and in many groups it is now possible to make rather certain determinations from characters of the immature forms themselves. Specimens so identified may be labeled *"determinatio ex systemate"* (*det. ex syst.*). Often such keys are only available for generic determination. It is possible, in those genera that have but a few included species, to use available descriptions for specific identifications and of course in a monotypic genus the generic key is all that is needed.

Identifications made in any of the above ways will, in great part, be based on structural characters. However, it often happens that identifications can be made by the use of less tangible characters. Such factors as distribution, habit, manner of life or even size can be helpful. These are circumstantial or ecological characters and not morphological. Association of a larva with its favorite food can lead to recognition but this is a somewhat unsafe method of identification. There are instances where known distribution is helpful. As an example only two species of the beetle genus *Nosodendron* are known in the United States. One species, *N. unicolor* Say is found in the eastern states and *N. californicum* Horn is from the west. The identification of either species of larvae, when the genus is known, can be made from its distributional data. Other conditions, such as occurrence on an island, an alpine habitat or in caves, can also lead to recognition. Such identified forms may be labeled *"determinatio ex patria"* (*det. ex pat.*). The habitat can lead to a determination of more or less value. For example, the syrphid-fly larva (*Volucella*) which lives symbiotically in the nests of ants, when determined, may be labeled *"determinatio ex symbiosi"* (*det. ex symb.*). On the basis of its habitat it may be marked *"determinatio ex domicilio"* (*det. ex dom.*). Nymphs of certain Coccidae and larvae of other forms such as inquilines found in ant colonies or *Zoraptera* nymphs in termite colonies may be designated as *"determinatio ex societate imaginis"* (*det. ex soc. imag.*). Furthermore, certain gall-forming species or other inhabitants of galls can be marked *"determinatio ex cecido"* (*det. ex cecid.*). Certain immature ecto- and entoparasites, such as larvae of the screwworm fly or sheep nose bot or nymphs of the hog louse are readily identifiable from their hosts and their method of recognition may be noted as *"determinatio ex hospite et sede"* (*det. ex h. et s.*). In a limited way, certain forms can be placed by their size. This may happen when the size of the adult or a certain instar is known. Then the label may read *"determinatio ex magnitudine"* (*det. ex mag.*). Lastly, the time of appearance or occurrence can lead to a time factor for recognition and the label may read *"determinatio ex tempora"* (*det. ex temp.*). As indicated above, Van Emden has proposed these terms, all of which first appeared in the German publication (1922) cited. In his recent English paper (1942) not all of these terms are discussed. This then should bring them to the attention of American workers. The adoption of this system of labeling, if used more generally would facilitate labeling. However, it has not been generally adopted although proposed over twenty years ago. In the writer's experience of handling thousands of vials of immature forms that have been named by various investigators he has never seen Van Emden's terms or abbreviations used.

EDITORIAL.

ON CRITICISM.

Many years ago this BULLETIN remarked on the absence of constructive controversy then (and now) in being. It brought to mind the fierce battles of opinion waged among entomologists. The point of the editorial was that such differences of views, brought out into the open, helped to clear up debated points, thus making for progress and better understanding.

Once more we present this thought to entomologists. Criticism and comment are necessary to the progress of science. It is unthinkable and unnatural that *all* workers in any given field should agree in and unquestioningly accept all and every finding, theory or opinion. If this be true, millennium might seem to be here, with the lion and the lamb gazing soulfully into each other's eyes, without any thoughts about succulent lamb chops. This simply does not follow the age-long processes of nature.

We must and should have constructive criticism of current work, just as we have of past work, for its better comprehension. And as debatable work appears in print, it should be subjected to the same evaluation, and its rectification should follow, also in print. It is not enough, nor is it fair and certainly not scientific, to find fault by loose word-of-mouth comment. If criticism be seriously made, then the author and his compeers should know it; the author, in sheer justice, should have the opportunity to present his side equally as publicly. Private criticism is often unfair and goes too far, frequently by indirection and personal remarks.

In all comment, personalities are superfluous and unnecessary. In time, workers disappear from the scene of their labors. But their work stays after them, to be accepted or rejected on its merits or lack of them.

Criticism of work should refer only to the thing in itself. The personal likable or dislikable characteristics of an author have no bearing on his scientific competence. Indeed, a just and fair appraisal will bring it out for all to see.

Personal dislikes are irrelevant and scientifically worth minus infinity. What have the personal habits or the personality of a worker to do with his scientific competence? Or with the validity of his work? One hears this or that fact or gossip about a man. What has it to do with his real knowledge? Names and instances come to mind; but the work of those personally maligned is still accurate, still reliable, and still basic. Accurate facts and valid conclusions live; passions and feelings pass into the limbo of forgotten things.

This is a plea for comment and criticism, plenty of it, constructive and above-board. It is also a measured and calculated condemnation of those who do not make their opinions public; and particularly of those who lack the cold, precise, impersonal serenity of the true scientific spirit, which seeks only for truth.

J. R. T.–B.

Further Records of the Snake Tick, Amblyomma dissimile Koch, in Florida.—Some recent publications seem to show that the distribution of this tick in the United States is as yet imperfectly known. Since I published the first records some years ago (1932, Psyche, XXXIX, pp. 45–47), I have seen four additional lots from three more hosts, all from Florida. One female was taken by Mr. Arthur Loveridge from a chicken snake, *Elaphe quadrivittata* Holbrook, collected by E. R. Allen in the Everglades, near the southern end of Lake Okeechobee. Two males and one female were sent in by Mr. S. Springer, from a Florida king snake, *Lampropeltis getulus floridana* Blanchard, taken 20 miles southeast of Naples, Collier Co. On two occasions Mr. G. Nelson collected males and females off the eastern diamond rattlesnake, *Crotalus adamanteus* Beauvois, at Sebastian, Indian River Co. Thus, *A. dissimile* is known at present from 5 snake hosts, in 4 localities covering nearly the southern half of the peninsula. As yet these native records are all in the eastern section.—J. Bequaert, Museum of Comparative Zoölogy, Cambridge, Mass.

BOOK NOTES.

A Bibliography of the Homoptera (Auchenorhyncha), by Xeno Payne Metcalf. 1945. Vol. I, Authors' List, A–Z, pp. 1–886; vol. II, List of Journals and Topical Index, pp. 1–186. North Carolina State College of Agriculture and Engineering, University of North Carolina, Raleigh, N. C. ($7.50 plus postage).

In this work we have what is probably the most extensive bibliography on a restricted group of the Hemiptera, in the broad sense, to be published in this country. To use it to best advantage and understandingly, the Introduction must be read. From it we cite a short paragraph, quoted from Weidlin & Hamor's "Glances at Industrial Research": "The scientific use of literature is the pilot of all scientific investigation. It is the intelligence service of all orderly inquiry, the preparational agent of factual determination, the guide of experimental trial in eliminating chance, in the whole realm of science. . . ." These words synthesize the basic purpose of this and other bibliographies. This work in its nature is destined to be a reference source of permanent value.

The Bibliography proper gives more than 8000 titles, 1000 separate journals and 900 general books in vol. 1; vol. II lists the journals and contains the extensive topical index. Assembling and preparing this great work are the fruit of 30 years of labor. Those who have done such research work are well able to appreciate the infinite care such gatherings of knowledge exact.

Physically, vol. I is a massive tome. It is, however, well bound, and it opens flat, a welcome feature in a desk reference volume. The paper in both parts is of fine quality; the press work and typography are both clear and free from errors. As books, they are outstanding.

While the work refers only to the Homoptera Auchenorhyncha, the extensive lists of works and journals are in general equally as useful for the Heteroptera in great part.

The North Carolina College of Agriculture is entitled to great praise for making available this work of such lasting importance and worth. To Dr. Metcalf go our warmest congratulations for his invaluable gift to his fellow-students of the Hemiptera.

J. R. T.–B.

General Catalogue of the Hemiptera: Fascicle IV, Fulgoroidea; part 4, Derbidae; part 5, Achilixiidae; part 6, Meenoplidae; part 7, Kinnaridae; by Dr. Z. P. Metcalf. Pp. 1–252. 1945. Smith College ($2.75).

We welcome another fascicle of this great Catalogue, which was begun in 1927 under the general editorship of Dr. Geza Horváth, and after his death under that of Mr. W. E. China. Of the fascicles thus far published, two only have been on Heteroptera, although 8 of the editorial board of 11 are professed heteropterists.

The present fascicle is on the general plan adopted: From family through genera, the groups are in taxonomic order, but within the genera species are alphabetically arranged. In all groups and species there is a wealth of citations.

Dr. Metcalf has our appreciation in full measure, for this labor of years, which reflects so much care and thought.

Insetos do Brasil—5° Tomo—Lepidópteros—1ª parte. By A. da Costa Lima. Pp. 1/379, figures 1/235. 1945. Escola Nacional de Agricultura—Serie Didáctica no. 7. Imprenta Nacional, Rio de Janeiro, Brazil. (No price given.)

This is another of the comprehensive volumes on the insects of Brazil by Dr. A. da Costa Lima. As the others, it contains extensive bibliographies at the end of each section, or chapter. The structural figures in general are original drawings or from photographs, although some of them are from Snodgrass so stated. The book has no numbered sections or chapters, each division, beginning with the one on biology and anatomy of Lepidoptera, takes up a group in serial order. The Lepidoptera are divided in standard manner into Jugatae and Frenatae, the former with two subfamilies and the latter with eight, each with its extensive bibliography. The index fills 19 pages, 361/379.

It is really unnecessary to qualify this monumental work, a great achievement of the author and of the country and institution that produces it.

One general comment is in order. While the series refers in its title to Brazil exclusively, the fact remains that to the degree that it refers to the insect fauna of the vast Amazon and its mesh of great tributaries, it is also good for those surrounding countries, parts of which lie within that river system—namely, to the Guianas, Venezuela, Colombia, Perú, Bolivia, and even into Paraguay and Argentina. Thus the whole work becomes necessary for anyone interested in tropical America and its faunas.

J. R. T.-B.

NOTICE

The Larvae of the Harpalinae Unisetosae, by Dr. Hung-Fu Chu, of the Institute of Zoology, of the National Academy of Peiping, China, forms no. 1, vol. XXV, of Entomologica Americana. This paper runs to some 80 pages, with 5 plates containing 92 figures of larval structures, as used in classification and in keys. It carries forward in more complete form this group of harpaline Coleoptera in their larval stages, adding to the outstanding work of Drs. Böving and Craighead in their work on Larvae of Coleoptera, published in the same journal. Those that possess the latter work will need Dr. Chu's for further light on the biology and structures of these harpalines.

The Brooklyn Entomological Society will accept prepublication orders for this work at a price of $2.00 per copy. After publication, the price will be advanced to $2.50, cash with order. Since the edition will be limited, it is advisable to order now, to be sure of receiving it. It is paper-bound, in our usual reprints form, with full data of date of publication, volume and number of Entomologica Americana in which it appears.

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PROCEEDINGS OF THE SOCIETY.

Meeting of December 14, 1944

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on Thursday evening, December 14, 1944. In the absence of Mr. Davis because of illness Vice President McElvare presided. The other members of the society present were: Messrs. Nicolay, Buchholz, Sheridan, Moennich, Naumann and Teale, together with 3 visitors.

A communication from Mr. Bueno, Editor of the Society's publications, was presented. Because of lack of storage facilities the Editor's recommendation that correspondence prior to 1940 be destroyed was approved.

A Nominating Committee consisting of Mr. Sheridan, Chairman, Mr. Buchholz and Mr. Naumann was appointed to nominate officers for 1945.

Mr. Teale reported on a visit made with Mr. McElvare, on the afternoon of the meeting, to the Staten Island General Hospital where Mr. Davis has been confined since last July. Mr. McElvare added that Mr. Davis in a formal statement had expressed his intentions of leaving his collection of the Cicadidae to the American Museum of Natural History, in New York City.

The program of the evening was an illustrated lecture on "Collecting in the Pacific Northwest" presented by Mr. Moennich. Kodachrome slides were used to illustrate his travel and collecting experiences, particularly in the region of the Olympic National Park in the state of Washington. Following a question period, the meeting adjourned at 9:40 P.M.

F. T. Naumann, *Secretary pro tem.*

Meeting of January 11, 1945

The annual meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on Jan. 11, 1945. The meeting was opened at 8:15 P.M. by Vice-President Rowland R. McElvare. Those present were: Mr. McElvare, Mr. Naumann, Mr. Teale, Mr. Sheridan, Mr. Buchholz, and Mr. Noaks. Since too few members were present to form a quorum the annual reports of committees were held over to be ratified at the next meeting.

The minutes of the previous meeting were approved as read. The Treasurer made a report on the financial standing of the Society for the period from Jan. 1, 1944 to Dec. 31, 1944. The report of the Publication Committee was presented to the Society by Mr. Teale. From all indications the Society's publications seem to be selling fairly well, however, not well enough to completely cover cost of printing. Mr. Teale also mentioned that there would be an increase in the number of pages in the Bulletin.

The Program Committee reported that speakers had been obtained for all meetings through March.

The report of the Nominating Committee was presented by Mr. Sheridan and was as follows:

For President & Treasurer—Mr. Rowland R. McElvare
Vice-President—Mr. Otto Buchholz
Honorary President—Mr. Wm. T. Davis, Mr. J. R. de la Torre-Bueno
Delegate to the N. Y. Academy of Sciences—Mr. Edwin W. Teale
Publication Committee—Mr. J. R. de la Torre-Bueno, Editor, Mr. Edwin W. Teale, and the Secretary
Executive Committee—Mr. Teale, Mr. Naumann, Mr. Buchholz.

The position of the Secretary is to be filled at the next meeting. Mr. McElvare regretfully informed the members of Mr. H. E. Wilford's withdrawing from the Society.

The speaker of the evening was Mr. Otto Buchholz who told the Society about his various interesting experiences in the Dismal Swamps.

The meeting adjourned at 10:15 P.M.

JOHN W. NOAKS, *Secretary, pro tem.*

MEETING OF FEBRUARY 15, 1945.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on February 15. The meeting was opened at 8:20 P.M. by Vice-President Rowland R. McElvare. Members present were: Messrs. R. R. McElvare, H. C. Moennich, E. D. Teale, Otto Buchholz, Dr. C. J. Goodnight, Alan S. Nicolay, and J. W. Noaks. Among the visitors were: Mrs. Marie Goodnight, John C. Pallister.

The minutes of the previous meeting was approved as read.

The Treasurer submitted a satisfactory report which was accepted.

A motion for a resolution, was made on account of the passing away of Mr. Wm. T. Davis. Mr. McElvare was appointed by the Society to make and enter this resolution in the Bulletin. Mr. McElvare stated that he had sent flowers to Mr. Davis's funeral and that he had received a letter from the Staten Island Museum thanking the Society for its consideration. A clipping was also read giving several high lights of the long and interesting life lead by Mr. Davis.

A motion was made by Mr. Buchholz to the affect that the annual reports of Committees and nomination for election of officers be accepted. Mr. McElvare made an amendment to this motion stating that Mr. Davis be given the title of Honorary President during the period he lived. The motion was restated including the amendment by Mr. Buchholz, was seconded and carried. Mr. Noaks was elected Secretary.

A motion was offered by Mr. McElvare nominating Mr. Sheridan, chairman, Mr. Edwin W. Teale, and Dr. C. J. Goodnight for the Program Committee. The motion was seconded and carried.

The speaker of the evening was Mr. Alan S. Nicolay who gave an interesting informal talk on the poor collecting season of 1944 mainly around Lakehurst, N. J.

The meeting adjourned at 10:00 P.M.

JOHN W. NOAKS, *Secretary, pro tem.*

MEETING OF MARCH 15, 1945

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on March 15, 1945.

The meeting was opened at 8:15 P.M. with President R. R. McElvare in the chair. Members present were: Messrs. McElvare, Buchholz, Naumann, Sheridan, Noaks and Dr. Goodnight. Among the visitors was Mrs. Goodnight.

The minutes of Feb., 1945, Feb., 1944, and Oct., 1944 were approved after minor corrections.

The Program Committee reported that Mr. Chris Olsen had accepted an invitation to speak before the Society in April.

Mr. McElvare mentioned that he had received a letter of thanks from Mr. Torre-Bueno who had been elected Honorary President.

Mr. McElvare offered a motion to the affect that another member be elected to the Executive Committee. The motion was seconded and passed. Mr. Naumann nominated Dr. Goodnight for this position. The nomination was seconded and carried. Dr. Goodnight was unanimously elected.

The speaker of the evening was Dr. Goodnight who presented to the Society a most interesting lecture illustrated with Kodachrome slides on the various forms of Phalangids. This talk was followed by a general discussion period.

The meeting adjourned at 9:50 P.M.

JOHN W. NOAKS, *Secretary.*

EXCHANGES AND FOR SALE.

This page is limited to exchange notices and to small For Sale advertisements from members of the Society and from actual paid subscribers to the Bulletin exclusively. *Exchange notices* from members of the Society and from subscribers are limited to *three (3) lines each,* including address; beyond 3 lines, there will be a charge of $1.00 for each 3 lines or less additional. *For Sale* ads will be charged at $1.25 for each 3 lines or part of 3 lines. *Commercial or business* advertisements will not be carried in this page, but will go in our regular advertising pages at our regular advertising rates to *everybody.*

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Vol. XL DECEMBER, 1945 No. 5

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BULLETIN

OF THE

BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XL December, 1945 No. 5

REVISION OF THE SCARAB BEETLES OF THE GENUS DICHELONYX.

By Lawrence W. Saylor, California Academy of Sciences,
San Francisco, Calif.

As it stands now in our catalogues, the genus *Dichelonyx* includes thirty-three species, all but two of them being known only from America north of Mexico; one of these latter species is from Lower California and the other was described from South America, but is undoubtedly in some similar-appearing genus (such as *Faula* or *Ceraspis*), since *Dichelonyx* is essentially a northern genus.

Since Fall's excellent paper on the genus in 1901, there has been nothing but scattered descriptions of the many new species published. Today any person wishing to determine his material in this group would have a good deal of difficulty, and, because of the great amount of complexity due to color and geographical variation, unless he were well acquainted with the genus he would in many cases have an almost impossible task. It is hoped that these notes will fill this need for an up-to-date revision of the group, and that the biological and other available data included will be of use. There are 25 species and 7 valid subspecies in the genus as limited by the writer.

During the past nine years the author has examined good series of all of the commoner species of *Dichelonyx* and at least several examples of each of the rarer species, in all over eight thousand specimens; the amount of individual variation as to color, etc., in some species (such as *vaga* and *fulgida*) is astonishing, and in *vaga* specimens may vary from almost entirely ochreous to very nearly entirely piceous, with all degrees of variation connecting the extremes. In the keys included herein, the writer has attempted to include as many of the variations as possible, so that the vast majority of the specimens, regardless of their individual variation, may be correctly keyed down; this has necessitated the inclusion of some few species several times, *subvittata* appearing in four different places in the key. It is felt that by this means very few specimens will be found which will not fit correctly into some part of the key.

Fall and Horn have given us a number of characters of use in the genus and I have found it necessary to add but little in this regard; however, some of those characters used before, when viewed in the light of very large series are partially or wholly unreliable (the variable hind thoracic angles and tibial spurs of *subvittata,* the impression of the clypeal suture of *muscula,* the degree of wrinkling of the elytra in *crotchi, fulgida* and *mormona,* and the hind thoracic angles of *vaga* and its near relatives).

It has been already pointed out by Fall that the genus *Dichelonyx* is essentially a northern one, being found in great part in the Transition and Boreal Zones; these latter in the Pacific Regions and in the Rocky Mountain Region extend entirely across the country, but in the East reach their southern limits in the vicinity of New York City and the southern lake regions, but are also found along the Alleghany Mountains and the highlands of Pennsylvania. The only characteristic species of the southern coastal or Carolinian region is *fuscula,* although others at times occur there. On the Pacific Coast the species inhabit almost all of the zones: *valida, decolorata* and *pallens* are endemic in the Coastal or Redwood Transition, the former ranging north to Oregon; *picea* and *nana* are probably true members of the Upper Sonoran fauna; *clypeata, muscula* and *truncata* inhabit variously the Upper Sonoran or Transitional Zones; *lateralis* and *vicina* occur from the Sierran Transition to the Canadian Zones while *fulgida* and is varieties are found more often in the Canadian Zones.

In his studies in this genus the author has been assisted by many individuals and institutions and has examined material from every major collection in the United States, as well as U. S. material in foreign collections. To the late Mr. H. C. Fall especially, the author is indebted for much useful advice and for the loan of specimens; to Dr. E. C. Van Dyke for his useful criticisms and loan of material from his own collection and that of the California Academy of Sciences, and to E. A. Chapin, W. J. Brown, C. A. Frost, M. A. Cazier, M. W. Sanderson and many other individuals for the loan or gift of specimens, the author wishes to express his sincerest thanks. Thanks are also due several associates at the University of California for their assistance in testing out the feasibility of the keys.

Though written originally in a much more complete form, the present size of this paper is necessitated to insure present publication. For this reason also no complete description is given, both because in cases of doubt the original descriptions are reasonably available to most persons, and because the discussions of the variable specimens of each species is felt to be much more important. Also, to save space, the bibliography of each species is omitted, since most of this information may be readily obtained through the *Coleoptorum Catalogus.* At the end of the paper the major articles dealing with the species of the genus are cited and all necessary bibliographical material may be obtained from this list.

CHARACTERS.

Clypeus. The apex may be strongly, or moderately, or not at all, reflexed, that is, turned up at more or less right angles to the clypeal surface, and in some instances may be turned back slightly upon itself. The angles, so called, are the outer angles at each side of the clypeus and except in two or three instances are usually broadly rounded. The clypeal suture is an important character in some instances and care should be taken in diagnosing it; if the front and clypeus are quite hairy the suture may appear to be strongly impressed, when in reality, if a careful examination is made and the hair removed or brushed aside, it will be seen that the suture is not, or but very slightly, impressed.

Antenna. All species except *picea* (8-segmented antennae) have 9-segmented antennae. Fall gives the number of antennal segments in his single female *robusta* as 8, but in a fairly large series of this species that I have examined all have 9 segments, although there is a tendency towards the 8 segments, as is evidenced by the apparent partial coalescence between segments five and six in many examples. The characters of the male antennae are not very specific, although in some, i.e.: male *pallens* and *vicina,* the former always has the club longer than the funicle and rarely as long as the entire stem, while the latter in some localities frequently has the antennal club a little longer than the funicle. In *clypeata* alone of the species is the male club much smaller than the funicle, as in the majority of the females. In female *pallens* the antennal club is longer than in most other females in the genus, and is but very little shorter than the funicle; this is not unexpected, however, since it is in proportion to that of the male, which is likewise longer than that of most of the males of the genus.

Maxillary palpi. A character which must be used with caution.

In the group with the non-sulcate thorax in most instances the terminal segments of the maxillary palpi are broader and more truncate in the male than in the female, although in *robusta, picea,* some *canadensis* and most *truncata* the terminal segment is slender and pointed or slightly truncate in both sexes.

Thorax. The most important character is the hind angles and these vary greatly between the species. While the character does not vary much within most species, in some such as *fulgida* and more especially *subvittata* there is a somewhat marked degree of difference. In those specimens in which the hind angles are densely covered with white pile or hair, some difficulty may be experienced in exactly making out the outlines of the angles; in such cases, by gently rubbing the pile off with the point of a pin or dissecting needle the angles may be readily seen. The longitudinal, median depression of the disc is in most cases very obvious if present, but some *pusilla* must be examined carefully lest they be placed in the wrong group.

Elytra. The rugosity and wrinkling of the elytra is responsible in most instances for the difference in sheen or metallic lustre between specimens of the same species and taken at the same time and place; an excellent example is a large series of *fulgida* var. from northern California which varies from extremely finely, rugosely wrinkled to rather coarsely so.

Abdomen. Other than sexual differences, the abdomen does not possess any specific characters as far as has been noticed. One should almost expect to find specific differences in the males of this genus since the same sex of the closely allied genus *Macrodactylus* possesses often quite remarkable variation in the abdominal structures.

Hind tibial spurs. It has already been noted that in the primary series having the sulcate thorax, all species except *pusilla* have the spurs equal in length but usually modified, with one either larger or much larger than the other, and often with both distinctly twisted or contorted. In *pusilla,* however, the spurs are unequal in length and acute, as is the case in most of the species of the other major group; moreover, it is of interest to note that in *pusilla* only is the thoracic sulcus only moderately impressed and in some instances even seemingly non-sulcate unless carefully observed. Thus *pusilla* does somewhat bridge over the differences between the two primary series of the genus.

The hind spurs have been stated by Fall as being subspatulate (one spur widened slightly towards apex, the latter rounded) in *diluta, subvittata* and *fuscula;* I have examined good series of all and although in *diluta* and most *subvittata* the character holds very well it is still not more than but very feebly indicated in about half of my series of *fuscula.* In *subvittata* also the spur character is not at all tenable in some specimens, while in others the larger spur may be of nearly equal length throughout its length and though but *very* feebly wider near apex could not truly be called subspatulate.

Front tibiae. The characters of the teeth of the front tibiae have been used but are not reliable in some instances. Those of *canadensis* are said to be bidentate or sub-bidentate but in a fairly large series I have examined, only one specimen was truly bidentate, three were sub-bidentate, and the remainder were truly tridentate; a character of such high variability is obviously of no use in a key.

Wings. The wings of all the species are well developed for flying; those of three species studied showed no differences of importance except differences in size, correlated with the sizes of the insects.

Genitalia. The writer has dissected and studied the genitalia of all the species except *picea, testacea* and *nana,* and the differences in the male genital piece are not specific and are too highly variable to be of any possible use in classification, although the sac and associated structures may possibly have some characters of use. If the genitalia are boiled in 10% potash solution for a few minutes and then the sac pressed out from inside of the chitinous claspers and washed in 95% alcohol, there are one to several small chitinous pieces whose number and shape appears to be somewhat specific and but little variable.

KEY TO THE GROUPS.

Thorax without median longitudinal sulcus, the disc evenly convex; claws in most species cleft, sometimes minutely so . . . . . *Group A*
Thoracic disc always with definite median longitudinal sulcus, at times the latter but little impressed; tarsal claws usually cleft in most species . . . . *Group B*

KEY TO THE SPECIES.

Group A.

(Includes both sexes.)

1. Antenna 8-segmented; color brownish to testaceous, elytra usually vittate. (Lower California) . . . . *picea.*
Antennae 9-segmented; color variable . . . . 2.

2.(1) Clypeus with sides noticeably or strongly convergent towards base; color entirely or in great part black. (Central Calif.) .... *clypeata*

Clypeus with sides not convergent basally; dorsal surface not black, or at least not entirely so .... *3.*

3.(2) Clypeal angles right-angled or even slightly acute (less obviously so); disc thorax apparently impunctate, in reality extremely finely rugose, punctures not evident .... *truncata.*

Clypeal angles variable, never acute or right-angled, disc not finely rugose, always obviously punctate .... *4.*

4.(3) Entirely testaceous, sides of thorax straight before and behind median dilation; hind tibial spurs never subspatulate; clypeal suture sharply angulate, evident but not at all impressed. (Northern U. S. and Canada) .... *testacea.*

Color variable, not entirely testaceous (very rarely so but then not with combination of characters as above) .... *5.*

5.(4) Elytra rufotestaceous or testaceous, head and thorax rufopiceous, the latter apparently without hair; male antennal club much shorter than funicle. (N. Mex.) .... *testaceipennis.*

Color variable, but not as above; thorax usually with discal pubescence .... *6.*

6.(5) Prevailing color of dorsal surface dark, elytra usually brilliant green or bronze, frequently with pale yellow margin .... *7.*

Prevailing color testaceous, often with pale lustre or *faintly* clouded with black .... *25.*

7.(6) Terminal segment of maxillary palpi distinctly narrowed apically, subelongate, not truncate .... *8.*

Terminal segment noticeably widened apically, often truncate .... *10.*

8.(7) Lateral margins of thorax as viewed from above broadly rounded, not angulate; elytra deep bottle green. (Central Calif. to Ore.) .... *robusta.*

Margins of thorax distinctly subangulate; elytra variable .... *9.*

9.(8) Elytra shining green; thorax sparsely punctured on disc, with smooth space at center. (S. Diego Co., Calif.) .... *nana.*

Elytra normally with cupreous tinge, rarely with slight greenish tinge, but never shining green. (S. Calif.) . . . . *muscula* (part)

10.(7) Pacific Coast Species. (Calif., Ore., Wash., B. C., Alberta) . . . . *11.*

Eastern species . . . . *20.*

11.(10) Hind thoracic angles very distinctly prominent; hind claws usually not cleft at apex . . . . *fulgida* (part)

Hind angles distinctly indicated but very obtuse, or broadly rounded; claws variable . . . . *12.*

12.(11) Male antennal club black, equal to or longer than funicle; color piceous with cupreous lustre . . . . *13.*

Male club testaceous, or if partially black then shorter than the funicle; color variable . . . . *14.*

13.(12) Sides of thorax behind median dilation near base slightly sinuate; form elongate; thorax usually piceous; clypeal suture usually deeply impressed. (Ore., Wash.) . . . . *fulgida* var.

Sides thorax not at all sinuate behind median dilation; form robust-oval; thorax rufopiceous; clypeus not at all or but slightly impressed. (Central Calif.) . . . . *pallens* (male)

14.(12) Hind tarsal claws not at all cleft . . . . *15.*

Hind tarsel claws definitely cleft . . . . *16.*

15.(14) Clypeus but very slightly reflexed; legs usually entirely testaceous, rarely rufopiceous; elytra bright green. (Calif. and Nevada) . . . . *fulgida crotchi* (part)

Clypeus markedly reflexed; legs piceous or nearly so, never pale; elytra piceous with slight greenish or copperish lustre. (Ariz.) . . . . . . *backii arizonica* (part)

16.(14) Form elongate; elytra three times as long as thorax or even longer. (N. Calif., Ariz., Ore., Wash., B. C.) . . . *17.*

Form robust-oval; elytra about two and one-half times as long as the thorax. (S. Calif. and Nev.) . . . . *19.*

17.(16) Legs usually entirely pale (rarely piceous); clypeus but very little reflexed. (Calif. and Nev.) . . . . *fulgida crotchi* (part)

Legs always entirely piceous or rarely rufopiceous; clypeus markedly reflexed . . . . *18.*

18.(17) Elytra bright shining green. (N. W. U. S. and Can.) . . . . *backii* (part)

Elytra always with very faint copperish, purplish, or greenish lustre, never bright green; form often quite large and robust. (Ariz.) .... *backii arizonica* (part)

19.(16) Clypeus almost square, truncate, broadly reflexed; elytra usually brilliant green without the nude, polished apical umbone .... *vaga* (part)

Clypeus much less square, sides more convergent apically and angles more broadly rounded; elytra usually with copperish lustre, very rarely green, the apical umbone of elytra nude and polished .... *muscula* (part)

20.(10) Hind thoracic angles very prominent, subrectangular .. *21.*

Hind thoracic angles distinct but much less prominent, never at all subrectangular .... *22.*

21.(20) Hind legs normally testaceous, with apical half dark or piceous, very rarely entirely pale; elytra often with greenish tinge; never vittate .... *elongata* (part)

Legs always entirely pale; elytra usually with humeral and apical umbones green or with copperish tinge, these areas often joined forming a lateral vitta, elytra rarely unicolorous .... *subvittata* (part)

22.(20) Elytra brilliant green, clypeus greatly reflexed at apex. *23.*

Elytra with cupreous or faint greenish tinge, rarely brilliant green but then the clypeus not reflexed .... *24.*

23.(22) Clypeus in great part testaceous, legs always pale testaceous .... *canadensis.*

Clypeus entirely black, legs always black .... *backii* (part)

24.(22) Clypeus slightly reflexed; in great part testaceous, usually with humeral and apical elytral umbones darker, often joined and forming vittae .... *subvittata* (part)

Clypeus broadly reflexed, elytra with pale lateral margin, never vittate .... *fuscula*

25.(6) Hind tibial spurs male with one broadened at tip and subspatulate .... *26.*

Hind spurs male spinose, not broadened .... *27.*

26.(25) Clypeal suture deeply impressed; elytra never with lateral vittae or apical umbones never green, always unicolorous .... *diluta*

Clypeal suture not impressed; elytra usually with humeral and apical umbones darker, often joined forming vittae .... *subvittata* (part)

27.(25) Hind angles of thorax very distinct, set off by a sinuation in front of them. (Western and Eastern U. S.) .. *28.*

Hind angles distinct but obtuse, not set off by a sinuation in front of them; females wholly testaceous. (Entirely Western U. S.) .... *30.*

28.(27) Clypeal suture deeply impressed. (Western) .... *fulgida oregona*

Clypeal suture not or but very slightly impressed. (Eastern) .... *29.*

29.(28) Hind legs normally testaceous, with apical half dark or piceous, very rarely entirely pale; elytra often with greenish tinge, never vittate .... *elongata* (part)

Hind legs always pale; elytra usually with humeral and apical umbones green, these often joined and forming a lateral vitta, very rarely elytra unicolorous .... *subvittata* (part)

30.(27) Thorax and head entirely pale .... *31.*

Thorax and head entirely or in great part black ..... *32.*

31.(30) Pygidium densely covered with hair, no scaly pile present, the pygidial surface visible between the hairs; antennal club usually black or dark ..... *pallens* (female)

Pygidium very densely covered with white pile, with some hair intermixed, pygidial surface often not visible; antennal club usually testaceous ... *vandykei* (female)

32.(30) Thorax coarsely densely punctured over the entire surface of disc including center, usually rather densely hairy; upper face front tibiae densely punctured. (Central and N. Calif.) .... *vandykei*

Thoracic punctures very variable, densely coarsely punctured or very finely sparsely punctured, with at least a small portion of center of disc impunctate or very sparsely punctured; upper face front tibiae usually finely, very sparsely punctured. (Central and S. Calif.) .... *vaga* var.

Group B.

I. Key to the Males.

(Abdomen concave in lateral view; antennal club subequal to funicle in length.)

1. Hind tibial spurs acute, equal or unequal in length, but otherwise similar .... *2.*

Hind tibial spurs contorted or twisted but always dissimilar in length .... *3.*

2.(1) Spurs very unequal in length, very acute; elytra testaceous or piceotestaceous, sometimes vittate. (S. Calif.) . . . . *pusilla*

Spurs usually nearly equal in length, broader; elytra with bright green or cupreous tinge, or with deep blue-green lustre. (Coastal, Central and S. Calif.) . . *valida*

3.(1) Species Eastern; elytra with pile arranged so as to form several vittae . . . . *albicollis*

Species Western; elytra vittate or not . . . . *4.*

4.(3) Prevailing color testaceous; with lateral vittae or at least darker humeral and apical umbones, rarely entirely testaceous . . . . *5.*

Prevailing color dark; usually with cupreous or greenish tinge; often without elytral vittae . . . . *7.*

5.(4) Hind tibiae with one spur but slightly wider than the other. very short; spurs not twisted; size small, 6.5 mm. to 9 mm. (Coastal Central Calif.) . . . . *decolorata*

Hind spurs twisted, long, one markedly wider than the other size larger, 10–13 mm. (Calif. Sierras and Ariz.) . . . . *6.*

6.(5) Elytral hair very thick, long, white; head with clypeus densely hairy and front with smooth longitudinal line. (Ariz.) . . . . *sulcata arizonensis*

Elytral hair sparse, short, fine; head with clypeus sparsely hairy and front often with longitudinal line, but the latter subrugosely punctate. (Calif. Sierras and Nev.) . . . . *lateralis*

7.(4) Thorax in great part, especially near median line, impunctate; clypeal suture deeply impressed; elytra piceous, deeply bronzed or dark green. (Ariz., Mont., Colo., N. Mex.) . . . . *sulcata*

Thorax in great part punctured; often with narrow smooth place on each side of median line; clypeal suture faintly impressed . . . . *8.*

8.(7) Elytra brilliant greenish, with pale lateral line. (Calif. Sierras and Nev.) . . . . *vicina*

Elytra piceous, with very deep greenish, copperish or purple lustre. (Idaho and British Columbia) . . . . *vicina columbiana*

II. Key to the Females.

(Abdomen robust and convex in lateral view; antennal club much shorter than funicle.)

(Based mostly on typical examples; unusual color and other variations are not uncommon and in such cases association with the male or locality must be used to determine the species.)

1. Eastern; elytra usually vittate .... *albicollis*
   Western; elytra variable .... *2.*

2.(1) Thorax in great part impunctate, color piceous with metallic lustre or testaceous with elytral umbones metallic. (Ariz., Colo., N. Mex.) .... *3.*
   Thorax in great part punctured, color variable. (West Coast or B. C.) .... *4.*

3.(2) Piceous with deep metallic lustre; thorax with large areas impunctate, especially near the median line. (Ariz., Colo., N. Mex.) .... *sulcata*
   Testaceous, with humeral and elytral apical umbones metallic, the two often joined forming a lateral vittae; thorax more densely punctured. (Ariz.) .... *sulcata arizonensis*

4.(2) Size small, less than 9 mm.; mostly Pacific Coast sp. . . *5.*
   Large and robust, more than 10 mm.; Coastal and Sierran .... *6.*

5.(4) Clypeus rather sharply reflexed, vertex without smooth area; sides of thorax straight behind median dilation. (S. Calif.) .... *pusilla*
   Clypeus very little reflexed, vertex usually with smooth area; sides of thorax sinuate behind median dilation. (Coastal Central Calif.) .... *decolorata* (part)

6.(4) Coastal species only; often with lateral piceous elytral vittae .... *7.*
   Inland mountain ranges only; never with lateral vittae. *8.*

7.(6) In great part testaceous, usually with humeral and apical metallic elytral spots, rarely these joined to form a lateral vittae. (Monterey and S. Cruz Co.'s, Calif.) .... *decolorata* (part)
   In great part piceous, elytra with brilliant green or cupreous sheen; unicolorous. (Coastal Central Calif.) .... *valida*

8.(6) Entirely rufotestaceous (very rarely colored as in male). (Central Sierras and Nevada) .... *lateralis*
   Color highly variable, but only very rarely entirely rufotestaceous; usually piceous with brilliant green or coppery reflections. (Sierras north to B. C.) .... *vicina* (and var.)

1. *Dichelonyx elongata* (Fabricius) 1792: 170.

Probably our commonest species, ranging throughout the New England States, south to New Jersey and Pennsylvania, west to Oklahoma and Kansas, and north through Canada.

In the very large series examined, quite a variation in color has been noted, especially that of the elytra; this may vary from barely discernible greenish tinges, to rather dark shades of green, copper and even bright violet or purple at times. The food plants are quite numerous, some of these being pine, birch, oak, willow and other conifers and hardwoods; if present in sufficient numbers the species at times do damage to ornamental shrubs and trees.

2. *Dichelonyx subvittata* LeConte 1856: 279.

Ranges throughout the northern New England and Lake States and into Canada. A very common species in many localities, and it has been recorded as feeding on hazel and pine in Pennsylvania.

One of the most variable species in the matter of the prominence of the hind angles and the color. Although specimens (in which the metallic spots or areas on the humeral and apical umbones of the elytra are either absent entirely, or are not joined) are by no means rare, in some few specimens the elytra may be entirely green except for a pale lateral margin; this is most noticeable in the females. It is of interest that the most variable specimens in the genus, those which show the most extremes of color, size and shape, are most frequently females.

3. *Dichelonyx diluta* Fall 1901: 283.

A fairly rare species, which I have seen from Massachusetts, New York, Michigan, Virginia, and Pennsylvania.

In stature resembles a pale example of *elongata* but the impressed clypeal suture and unicolorous hind legs will readily separate the present species; it may also be separated from *subvittata* by the more markedly subspatulate hind spurs, the impressed clypeal suture and the less angulate hind thoracic angles, and from *testacea* by the spurs and impressed clypeal suture.

4. *Dichelonyx testacea* Kirby 1837: 135.

An uncommon species of northern range. It is recorded from Missouri, Nebraska, Montana, Vermont, Lake Superior and Canada.

One of the females from Missouri has the head and thorax rufotestaceous but appears to be this species; another from Alberta, Canada, has the front tibiae wider than usual and distinctly bidentate, while all others I have seen are tridentate. While this species resembles *diluta* in color, the much more robust instead of slender form should separate the two; from *pallens* it differs especially in the much smaller antennal club and also the distribution.

5. *Dichelonyx testaceipennis* Fall 1907: 249.

One of the most endemic species of the genus, except possibly *nana* or *picea,* being found only at the type locality (Cloudcroft, New Mexico) as far as I know. Uncommon in collections, but probably locally abundant; I have seen about three dozen specimens.

Hardly any variation in color; one female only had the thorax piceous instead of rufotestaceous. The facies of the species are such that it may be immediately picked out in any series.

6. *Dichelonyx backii* Kirby 1837: 134.

A common species over a wide range; has been recorded from most of the country north and west of Lake Superior and throughout the Rocky Mountains. Fall cites it from Wyoming, Colorado and (?) Southern California, but it is quite possible that the latter locality may have been based on some of the peculiar varieties of *vaga.*

Typical examples can usually be picked out easily from any collection as belonging to this species, which is characterized by the brilliant green elytra, piceous body and strongly reflexed clypeus; intermediates, however, are not lacking, and these are often puzzling.

7. *Dichelonyx backii arizonica* Barrett 1933: 132.

Similar in all respects to the typical species except: it is larger, more elongate, elytra are typically bronzed instead of green, the antennal clubs in some specimens are very slightly longer than the funicle, while in others the clubs are slightly shorter, more as in typical *backii.* Arizona. Recorded as taken in a Douglas Fir (*Pseudotsuga*) forest.

Although at first glance a few of the specimens may appear to be distinct, careful study shows them to be subspecies of *backii.* Four specimens from the type locality in my collection (kindness of Mr. Barrett and Mr. Parker) have a coppery-green lustre, while another from the White Mountains and two more from the Grand Canyon, Arizona, have a bright coppery or violet lustre predominating. In my series, almost all differences between typical *backii* and typical *arizonica* are bridged over.

8. *Dichelonyx nana* Fall 1901: 286.

This small species is known only from San Diego County in California.

This species is very close to *vaga* and long series may prove it to be only a subspecies or variety of it, as it differs in having the clypeus less parallel-sided, and the thorax less punctured. A much more northern specimen of *vaga* is so close to the form *nana* that it is hard to distinguish the two. Both species have the open elytral sutural area as mentioned by Fall as separating *vaga* from *muscula,* but the latter species when viewed in large series often has exactly the same type of open sutural angles.

9. *Dichelonyx vaga* Fall 1901: 285.

An unusually variable species as regards color and puncturation. The elytra are deep blue-green, black with slight greenish sheen, or even deep yellow; legs deep yellow, testaceous, rufotestaceous or piceous; antennae testaceous, yellow or piceous, with the club always darker than the funicle; prothorax and scutellum always black. In a few specimens the sides of the thorax are yellow or testaceous; clypeus piceous or pale. Southern California and Nevada, on all types of conifers.

My large series from Sequoia National Park in southern California illustrates the extremes of variation as shown in the species, and the specimens with deep yellow legs and elytra look like nothing else in the genus.

10. *Dichelonyx muscula* Fall 1901: 286.

A common southern California species which can usually be readily picked out by its deep bronze or purplish sheen. Occurs on many types of trees and shrubs, including rose bushes in the city. The occasional color varieties are mentioned in the key.

D. muscula and *vaga* are very close but distinct, and the key characters should separate them.

11. *Dichelonyx canadensis* Horn 1876: 186.

A rather uncommon species from Canada; I have seen a dozen specimens, all from Quebec.

Varies in the front tibiae, being bidentate or tridentate; otherwise varies but little, and looks like a smaller individual of *backii* at first glance, but besides other characters it differs in the pale legs, pale clypeus and very strongly shining surface.

12. *Dichelonyx fuscula* LeConte 1856: 281.

A common eastern species, recorded from Ohio, New Jersey, Pennsylvania and New York.

The front tibiae may be either bi- or tridentate, while some few specimens may have long, dense, yellow, somewhat recumbent, hairs on the pronotum. As to color variation, one female observed was all black except for the rufopiceous legs and antennae, while another was entirely rufotestaceous except for the elytra. No variation observed in the male. Fall says there is a tendency towards having the hind spurs subspatulate, but in a series of nearly forty specimens, I have been unable to observe this.

13. *Dichelonyx fulgida* LeConte 1856: 279.

This species includes the most variable and highly complex group of the genus, and it is in this complex that the greatest variation of opinion between various workers on the genus exists. It is admittedly difficult to know just where to draw the line as to specific differences in the series, and to know just which specimens constitute racial variations and which are valid subspecies; if one compares the opposites of a series he is often amazed at the differences but when he begins fitting in long series of intermediate specimens between these extremes he begins to see the true relationships of the complex. Having studied very large series of over six hundred specimens, from many different localities in the West, my conclusions are such as are evidenced here. I believe that *crotchi* and *oregona* are quite valid subspecies, which are in many instances almost linked up with typical *fulgida* by means of intermediate forms, while *mormona*'s status is somewhat in doubt, though I do not believe it can be more than a geographical race at most.

Typical *fulgida* is entirely piceous, with sharp hind thoracic angles, slightly reflexed clypeus, and shining green elytra; it differs from *backii* mostly in the much more elongate form, much less reflexed clypeus and somewhat longer antennal club.

As to the varieties and intermediate forms, these are very numerous. The thorax varies from piceous to rufous (the latter especially in females), and the elytra from very light green to deep bottle-blue green. The greatest variation I have seen is in Lassen and Modoc counties in northern California where *crotchi* and *fulgida* overlap; in a large series from this locality, which includes many typical forms of *fulgida*, specimens of a very unusual nature were found. These specimens varied in elytral coloration from the most brilliant bright blue, to light lavender and deep bluish-purple, with the rugosity of the elytra very coarsely transversely wrinkled varying to unusually finely wrinkled; in some specimens, also, the entire thorax and often the legs would be pale testaceous. A peculiar variety from Crater Lake in Oregon is piceous with rather sombre-colored blue-black elytra, and with slightly more reflexed clypeus and slightly longer antennal club. Another fine series from Mt. Adams, Washington, includes mostly piceous specimens having the elytra black with a faint greenish or cupreous tinge, while a third variety from Carson City, Nevada, approaches (in its robust form and faint cupreous elytral lustre) *backii arizonica,* but of course differs in the more obtuse hind thoracic angles and the much less reflexed clypeus. None of these above-cited varieties or races or color variations are in any way entitled to names, since they are only variations of a sort from the parent stock and when studied carefully are found to tie in with that stock very closely, regardless of their apparent great superficial differences.

14. *Dichelonyx fulgida crotchi* Horn 1876: 186.

Common in the middle and high Sierras of California and found occasionaly in Nevada. Beaten most frequently from low growths of true fir, but also occurs on most of the other conifers, and is occasionally taken on or near flowers.

The true form *crotchi* has entirely pale legs, with the thorax usually rather densely (and often very densely) hairy, and the elytra a bright light-greenish. Many intermediates have been seen, however, and the legs may be entirely black or piceous, and the form elongate to robust, in individuals taken at the same time and place. Really the only character that definitely separates the subspecies is the color of the elytra, which seems to be always much lighter than in most *fulgida,* as the latter is usually either deep green or light-colored with a faint greenish or copperish sheen. Characters which have been used before, such as the obtuseness of the hind thoracic angles and the supposedly different thoracic puncturation, when examined in the light of large series are highly variable and do not hold at all.

15. *Dichelonyx fulgida oregona* Van Dyke 1918: 11.

This species is not common and is known from Oregon and British Columbia. I have seen several dozen specimens, including the types, and while typical specimens from the type locality appear quite different superficially, all intermediates approaching the more typical *fulgida* have been seen. The present species may be separated by its uniform dark testaceous color, with usually rufopiceous or rufotestaceous head and thorax (rarely entirely testaceous), and the usually slightly more reflexed clypeus.

16. *Dichelonyx fulgida mormona* Fall 1907: 249.

I have seen about two dozen specimens of this form from Utah (kindness of Vasco Tanner) and the only difference between this and the typical form is the slightly shorter body, less impressed clypeal suture, and slightly different elytral rugosity. As mentioned before, the elytral rugosity in the present complex is of no use specifically due to its high variability, and my personal opinion is that this is at the very most a weak variety of *fulgida,* and is hardly deserving of subspecific designation.

17. *Dichelonyx vandykei* Saylor 1932: 284.

This species, while rare in collections, is somewhat abundant in a few localities. Known from Yosemite Valley, Butte County, and El Dorado County in California, taken from *Quercus kelloggii* and *chrysolepis* and from willow.

Superficially resembles *fulgida oregona* quite a bit, but differs especially in the much less prominent hind thoracic angles and in the denser thoracic puncturation. One form of the species, from Big Bend Mountain in Butte County, California, superficially resembles *decolorata* very closely, since it has the lateral and sutural dark areas or vittae on the elytra, but among other things this species can be readily told from *decolorata* by the absence of the median thoracic sulcus.

18. *Dichelonyx pallens* LeConte 1856: 283.

A rather rare species confined to the central coast region of California. The sharp differences in the color between the two sexes is best illustrated in this species of any of those in the genus, since the males are always piceous with a cupreous tinge, while the females are always entirely pale testaceous.

Beaten from oak in Mendocino and Sonoma counties, and cited by Fall as from the Santa Cruz Mountains; I have recently obtained a specimen from the collector, Mr. D. Jensen, taken just slightly north of Point Sur on the coast, in the range of the Santa Lucia Mountains. This last specimen was beaten from *Artemisia sp.* (by Jensen and the writer) and was only a short distance from the ocean, but in all probability the specimen, which was a male, had only flown to the *Artemisia* to rest and was not feeding upon it; there were no obvious conifers in the near vicinity. An early spring form, taken in March through April.

19. *Dichelonyx robusta* Fall 1901: 288.

An uncommon species which is rather local, though widely distributed over the known range, having been taken at Corvallis, Oregon, and Mt. Hamilton and Santa Cruz in California; it has not to my knowledge been taken in between these localities. At Mt. Hamilton in middle May I have dug numerous adults out from around the roots of the bunch-grass, in which the larva probably live; also collected at Santa Cruz by B. Tilden on grass.

Differs from most others of the genus in the evenly rounded and not angulate lateral margin of the thorax, the deep rather sombre blue-green of the elytra and the hairyness of the upper surface.

20. *Dichelonyx clypeata* Horn 1876: 187.

One of the rarest species in California, possibly partly because of its early spring habits; found flying in the redwood regions of the coast from late January through March, and at times in April. I have taken adults in the Santa Cruz Mountains feeding on apple blossoms or buds, and also on redwood.

The very dark color, convergent sides of the clypeus and small male antennal club will readily separate the species, which is known from Sonoma, Alameda, San Mateo and Santa Cruz counties in California.

21. *Dichelonyx truncata* LeConte 1856: 281.

A somewhat common species in parts of southern California and Utah. Usually easily distinguished by the right-angles of the male clypeus, but several specimens have been seen in which the clypeal angles were much less evident than usual, and in such cases the extremely-finely rugose, apparently impunctate thorax will have to be used to separate the species.

Varies greatly in color. The elytra are usually testaceous, often with a pale or dark green sheen, though sometimes a deep yellow, piceous with green sheen, or dark grey. Pronotum either piceous with greyish white, whitish, or bright yellow hair, or rufous; rarely the whole insect except for the apical portions of the legs black. Taken on numerous food plants, including rose and *Fremontia.*

22. *Dichelonyx picea* Horn 1894: 396.

I have seen less than two dozen specimens of this uncommon species including the type; the latter is a female and is entirely rufous, with the antennae testaceous. Some males have a slight indication of a vitta on the elytra, while the latter is characteristic of most females.

Form elongate, hind angles thorax obtuse and not well defined. Confined to the Cape region of Lower California (San José del Cabo, El Chinche, Todos Santos and Miraflores).

23. *Dichelonyx pusilla* LeConte 1856: 282.

This species is rather common in parts of Southern California and is known from Central California to Lower California. The adults have been taken on the blossoms of *Adenostoma* (Chemise), and also on rose bushes. The elytral vestiture, which is usually arranged in bands so as to make the costae appear rather prominent, is rather characteristic of the species. Varies but little in color or size.

24. *Dichelonyx decolorata* Fall 1901: 290.

Rather uncommon in collections though locally abundant, and I have collected many hundreds of specimens from the foliage of Knobcone Pine (*Pinus tuberculata*) in the "sand hills" of the Santa Cruz Mountains near Ben Lomond, California; the early spring arrival of the species, usually from March to May, may account for the rarity of the species in collections. To my knowledge the species is known only from Santa Clara, Santa Cruz and Monterey counties in California. The piceous, in great part testaceous elytra are often clouded with black near the sides. Females at times approach those of *lateralis* but may be readily separated by the short, and almost equal hind tibial spurs, and more deeply impressed pronotal sulcus.

25. *Dichelonyx valida* LeConte 1856: 281.

The hind tibial spurs of the male are usually equal but vary considerably in length, ranging from very short and quite stubby to long and narrow. This is our commonest coastal species, ranging from Santa Cruz County in California north to Oregon, and never going inland more than a few miles. The only character to separate the females of this and *vicina* is the deeply cleft claws (entire in the latter); in over 150 specimens examined I have only found one female *vicina* with slightly cleft claws, so that the character is fairly reliable. All specimens I have taken have been beaten from the foliage of Douglas Fir (*Pseudotsuga*), Coast Redwood (*Sequoia*) and California Bay (*Umbellularia*), especially the first. I have on one occasion found numerous individuals flying (during the day) around a flowering bay tree, and many were copulating thereon; this occurred in early March.

26. *Dichelonyx vicina* Fall 1901: 291.

The species ranges throughout California and Nevada (Carson City), and possibly Oregon (?Corvallis, 2 specimens). One example I have seen from Modoc County, California, was entirely piceous except for the hind femora, front legs and apex of the clypeus, which were testaceous,—a most unusual color variety. *D. vicina* is a mountain species only, while *valida* is entirely coastal.

The species is very variable in the form of the male hind tibial spurs: they are usually equal in length but one is always much wider than the other,—the wider spur is usually rounded on the outer side and sometimes truncate at apex. Some specimens from the southern part of the state have the two spurs of almost equal size, greatly twisted and very truncate at apex, sometimes even slightly emarginate. In my opinion, *D. columbiana* Hopping (1931: 236), is at most a subspecies of *vicina,* characterized by its more northern range and the dark fuscous elytra with the coppery tinge; I have seen examples of it from British Columbia and Idaho (see Saylor 1939: 455).

27. *Dichelonyx sulcata* LeConte.

The smooth areas of the thorax, especially near the median line, are characteristic of the species. Ranges through the mountains of Colorado, New Mexico, Montana, and Arizona. *D. arizonensis* Saylor (1933: 158) is a valid subspecies from Arizona, characterized by the pale testaceous color and the metallic, darker humeral and apical spots on the elytra, much as exists in *subvittata;* in the two dozen specimens of *arizonensis* that I have examined there appears to be no variation.

28. *Dichelonyx lateralis* Fall 1901: 292.

A fairly large, uncommon species known only from the Middle Sierra Mountains (Placer, El Dorado and Plumas counties) in California and Nevada. I have collected it from the foliage of White Fir in El Dorado County in June. The male hind tibial spurs are about equal in length, the inner almost twice as wide as the outer, distinctly twisted and very truncate at apex, the outer rounded and only slightly truncate. The color varies but little and the species resembles a large *decolorata.*

29. *Dichelonyx albicollis* (Burmeister) 1855: 74.

This large, well-marked eastern species is from the Middle States and Lake Superior regions (Connecticut, Michigan, New Jersey, Pennsylvania, Massachusetts, etc., as well as Ontario and New Brunswick in Canada.) The vittate elytra are very characteristic and the species is also quite robust. There is much variation in the spurs of the male hind tibiae: the inner may be broadly rounded on one side and pointed at apex, or may be slightly rounded and very truncate and emarginate at apex. There is very little color variation, though the greenish sheen may be less bright in some specimens.

LIST OF SPECIES.

1. *elongata* (Fab.)
    - *elongatula* (Schon.)
    - *hexagona* (Germ.)
    - *linearis* (Gyll.)
    - *virescens* (Kby.)
2. *subvittata* LeConte
3. *diluta* Fall
4. *testacea* Kirby
5. *testaceipennis* Fall
6. *canadensis* Horn
7. *backii* Kirby
    - subsp. *arizonica* Barrett
8. *fulgida* LeConte
    - subsp. *f. fulgida* LeConte
    - subsp. *crotchi* Horn
    - subsp. *oregona* Van Dyke
    - subsp. *mormona* Fall
9. *vandykei* Saylor
10. *nana* Fall
11. *fuscula* LeConte
12. *muscula* Fall
13. *vaga* Fall
14. *pallens* LeConte
    - *longiclava* Fall
15. *robusta* Fall
16. *clypeata* Horn
17. *truncata* LeConte
18. *picea* Horn
19. *pusilla* LeConte
20. *decolorata* Fall
21. *lateralis* Fall
22. *valida* LeConte
23. *vicina* Fall
    - subsp. *columbiana* Hopp.
    - *deserta* Hopp.
24. *sulcata* LeConte
    - subsp. *arizonensis* Saylor
25. *albicollis* (Burmeister)

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HENRY J. DIETZ.

With deep regret we note the death on December 8 last of a good friend and faithful member of our Society, Mr. Henry J. Dietz, who was taken suddenly. He was the perfect type of the amateur collector, whose labors are always so fruitful for science. We shall present a more extended appreciation of our late friend in the next number of the BULLETIN.

J. R. T.-B.

Nabis at Light.—Insects attracted to neon lights were extremely abundant on the white-painted walls of a small theatre at Lovelock, Nevada, on the night of July 23, 1944. As many as 25 to 35 *Nabis alternatus* Parsh were present during much of the time among the insect visitors during the nearly 30 minutes, while observations were being made, between 10 and 10: 30 P.M. (Mountain War Time). During this period of observation, *Nabis alternatus* individuals were seen to be feeding on: one of the numerous midges; a small green *Empoasca* sp. leafhopper; a winged *Aphis carbocolor* Gill.; a subimago mayfly; and a slender, fragile green adult Mirid. A few *Nabis ferus* (L.) also were present; one fed upon a mosquito, *Aedes dorsalis* (Mg.); another on a small midge. A single *Nabis roseipennis* Reuter was around for some time; finally it fed on a winged *Macrosiphum pisi* Kalt. aphid.

On white walls of a nearby Auto Court, a number of *Nabis alternatus* were present also, one being observed to be feeding on a midge. Of three *Sinea diadema* observed at lights during the evening, one had been captured and was feeding on a winged mayfly.—GEORGE F. KNOWLTON, Utah State Agricultural College, Logan.

GRASSHOPPERS OVIPOSITING IN A PILE OF COAL.

By H. C. Severin, Brookings, S. Dak.

In North America grasshoppers with few exceptions prefer to lay their eggs in soil or among the roots or stems of plants in soil. Occasionally, however, man-made conditions may be created, which may upset the usual routine and then oviposition by grasshoppers may occur in strange and unexpected places. W. B. Fox,[1] while making a grasshopper egg survey in southern Saskatchewan during the autumn of 1942, observed large numbers of *Melanoplus bivittatus* (Say) ovipositing in heating piles of wheat temporarily left in the grain fields after harvest. At times, as high as 25 to 50 specimens of *M. bivittatus* adults were found clustered on a square yard of the sloping sides of the piles of wheat. A few adult *Melanoplus mexicanus mexicanus* (Sauss.) and *Melanoplus packardii* (Scudd.) were also seen on the piles of wheat by Fox but apparently these species were not observed ovipositing. Fox stated that the grasshoppers were attracted to the piles of wheat during cool weather only. Even though the temperature was too cool for grasshopper activity elsewhere, many *M. bivittatus* females were observed ovipositing in the wheat and even during a cold rain. The temperature of the surfaces of the piles of wheat at these times was 80 degrees F. while the air temperature was 50 degrees F.

It is common knowledge that in the fall of the year when air and soil temperatures become low, grasshopper activity is correspondingly slowed up. Whenever the temperatures, both air and soil, run higher, the activity of grasshoppers is correspondingly increased until finally hopping, flying, feeding, mating and oviposition take place. Grasshoppers are attracted to warm areas on cool or cold days, but the air or soil temperature must be at least sufficiently high on such occasions to induce crawling. At such times, the grasshoppers may be attracted to open spots in fields, to the south side of fence posts, buildings, farm machinery, piles of heating grain lying on the ground or to other areas or objects where the temperature is closer to the optimum that grasshoppers enjoy.

It has been customary to ship in during the summer and fall much of the coal that is used for heat and power production during the winter and early spring at South Dakota State College. This coal is a soft Illinois coal that was screened through a sieve of one and one-half inch mesh. Some of the coal is naturally in powder form. The pile of coal through slow and at times rapid oxidation becomes warm or hot in its interior. The surface of the pile of coal is cooler than is the interior except on sunshiny days. On such days heat is absorbed by the surface coal and then the temperature rapidly rises on the surface, so that its temperature may be 30 or more degrees Fahrenheit higher than the surface of the neighboring soil.

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[1] Fox, W. B. 1944. An Unusual Egg-Laying Site for The Two-Striped Grasshopper. Can. Ent., 76: 111.

In the immediate neighborhood of the coal are some horticultural plots and some buildings surrounded by grass-grown and weedy areas. Both plots and weedy and grass-grown areas harbor grasshoppers in some numbers each year.

In the fall when the weather becomes cool or cold, the live grasshoppers in the area described are attracted to the coal on sunshiny days. The grasshoppers begin to move sluggishly over toward the coal as soon as the temperature warms up sufficiently to stir them into activity. When once on the warm coal, the body temperature of the grasshoppers is slowly and correspondingly raised, so that the insects begin to become more and more active. They may begin to hop instead of crawl, they may fly, they may mate and the females may even oviposit. Species that were observed to mate and oviposit in the coal were the following:

Melanoplus bivittatus (Say)
Melanoplus differentialis (Thos.)
Melanoplus mexicanus mexicanus (Sauss.)
Melanoplus femur-rubrum femur-rubrum (DeG.)
Dissosteira carolina (Linn.)

Hundreds of grasshopper egg pods were obtained by the writer by passing some of the surface layer of coal through a screen.

As the afternoons of the fall days begin to cool off, many of the grasshoppers on the coal were observed to burrow into the deeper and warm coal until the insects were completely out of sight. Here they would remain until the surface of the coal warmed up again sufficiently on some following day, when they would make their way to the surface again.

NEW NICOCLES WITH A KEY TO THE SPECIES (DIPTERA, ASILIDAE).

By J. Wilcox, Alhambra, Calif.

In this paper two species are described as new, and a key to the species known to occur in North America is presented. Representatives of all the described species have been seen, but unfortunately in several cases only one sex has been examined, so it has not been possible to present characters for both sexes throughout the key. Until more data are accumulated, I am considering *punctipennis* Melander to be a synonym of *utahensis* Banks; both sexes from Utah and females from Washington and Alberta have been examined. References to the species described since Back's[1] monograph was published have been included in the key.

Nicocles Jaennicke.

Key to the Species.

1. Eastern and Southern species 2
   Western species 5
2. At least apical two-thirds of wings dusky, at most with clear spots in marginal cell 3
   Dark portion of wings in form of clouds along veins, the cells more or less hyaline 4
3. Femora black except very narrowly at apex; basal third of the wings largely hyaline; knob of halteres brown; length 8–10 mm. (Ga., Mass., Md., N. C., N. J., N. Y., Pa., S. C.) . . . . *politus* Say
   Hind femora red; wings wholly smoky, slightly lighter on the apical third; knob of halteres yellow; length 7–9 mm. (S. C., N. C.) . . . . **engelhardti,** n. sp.
4. Femora entirely red; style of the antennae about one-fourth the length of the third joint; abdomen only pollinose laterally except on fifth segment; length 10 mm. (D. C., Fla., Ga., N. J.) . . . . *pictus* Loew
   Apical third of middle and apical half of fore femora black; style one-half length of third antennal joint; abdomen wholly thinly pollinose; length 9 mm. (Texas.) (Ann. Ent. Soc. Amer., XXVII, 91–92, 1934) . . . . *reinhardi* Bromley
5. Abdomen in ground color largely red 6
   Abdomen in ground color largely black 8

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[1] Trans. Amer. Ent. Soc., XXXV, 383–392, 1909.

6. Body and legs wholly red, the proboscis, lower part of sternopleura, and a transverse spot at base of second abdominal segment black; disc of scutellum with very short, inconspicuous hair; length 10–11 mm. (Ore., Wash.) .... *rufus* Williston

Head and thorax largely black; scutellum with conspicuous hair 7

7. Abdomen, except base of second segment, yellowish red; posterior cells 3–5 of the wings largely clouded; male fifth abdominal segment not more than twice as wide as long; length 11 mm. (Calif.) (Psyche, XXIII, 67–69, Plate 7, Fig. 1, 1916) .... *lomae* Cole

First two abdominal segments black; posterior cells 3–5 largely hyaline; male "fifth abdominal segment about four times broader than long"; length 11–14 mm. (Calif.) .... *abdominalis* Williston

8. Only the sixth male abdominal segment wholly silvery, the fifth segment sometimes partly silvery or pollinose 9

Fifth and sixth male abdominal segments wholly silvery ... 11[2]

9. Fifth male abdominal segment bare of pollen except along lateral margins, twice as broad as long; fourth posterior cell largely hyaline (compare with female *dives* Loew); length 8–11 mm. (B. C., Oreg., Wash.) (Canad. Ent., LV, 208–209, 1923) .... *canadensis* Curran

Fifth male abdominal segment with a complete anterior pollinose band 10

10. Pollinose band on the fifth male abdominal segment concave, segments 2–4 pollinose only on lateral margins; wings with small brown spots along veins, crossveins, and furcations; length 12–13 mm. (Alta., Utah, Wash.) (*punctipennis* Melander, Psyche, XXX, 217, 1923.) (Canad. Ent., LII, 66–67, 1920) .... *utahensis* Banks

Segments 2–5 of male abdomen with complete parallel anterior transverse pollinose bands; wings more extensively infuscated; length 11 mm. (B. C., Mont.) ... **pollinosa**, n. sp.

11. Posterior cells 2–5, except narrowly basally, hyaline; hind tibiae and tarsi of males densely silvery on inner side;

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[2] *Nicocles bromleyi* Hardy (Jr. Kans. Ent. Soc. 16, pp. 28–29) from Arizona, traces to couplet 11. Its small size (7–7.4 mm.), fumose wings except at tip and male fifth abdominal segment about 4 times as wide as long, should readily separate it.

female abdomen almost wholly pollinose; length 8–10 mm. (Calif.) .... *argentatus* Coquillett

Posterior cells 2–5 largely villous; male hind tibiae not silvery 12

12. Male fifth abdominal segment twice as wide as long; female abdominal segments 2–4 with interrupted anterior bands, segment 5 largely, and segments 6–7 wholly, pollinose; length 9–13 mm. (Calif.) .... *aemulator* Loew

Male fifth abdominal segment nearly three times as wide as long; female abdomen with only sides of segments, and segment 5 with larger lateral triangular spots, pollinose; length 8–13 mm. (Calif., Oreg., Wash.) .... *dives* Loew

Nicocles engelhardti, new species.

Male: Length 7 mm. Head black; face, front, and upper occiput brownish pollinose; lower occiput white pollinose. Mystax, antennal, occipital, and bristles on ocellar tubercle yellowish; frontal hairs yellowish; beard and hairs on face, palpi, and proboscis white. Antennae black; first two joints subequal in length, the third one and one-half times the length of the first two joints together, style one-third the length of the third joint.

Thorax black; mesonotum brownish pollinose, the central stripe dull black. Hairs and bristles yellowish; 2 presutural, 1 postalar, 1 supraalar, and 3 dorsocentrals. Scutellum brownish pollinose and fine yellowish haired, one strong and one weak pair of apical bristles. Pleura and coxae largely white pollinose with touches of brownish pollen dorsally, anteriorly, and ventrally; hairs white, hypopleurals yellowish.

Abdomen shining black, the sixth segment appearing yellow in ground color. Sides of first segment and narrow lateral anterior margins of segments 2–4 grayish pollinose, segments 5–6 wholly silvery, venter brownish pollinose, segment 5 two and one-half times as broad as long. Hairs yellowish, genitalia blackish with ventral clump of brownish hairs.

Fore and middle femora, except apically, and the outer half of the fifth tarsal joints, black; otherwise legs yellowish red. Hairs and bristles yellowish, on hind tarsi brownish; claws black; pulvilli brown.

Halteres yellow, the base brown. Wings uniformly brown, somewhat lighter on the apical third and with two small, light spots in the subcostal cell. Veins dark brown, anterior crossvein at seven-elevenths distance from base to apex of discal cell.

Female: Length 9 mm. Similar. Scutellum grayish pollinose. Sides of abdominal segments 1–7 grayish pollinose, the posterior corners of segments 3–5 bare of pollen; posterior margin of segment 5 and segments 6–8 brownish; apical spines black. Wings slightly lighter, with indications of darker spots along the veins and furcations.

Holotype: Male, Myrtle Bay, S. C., October 3, 1938 (G. P. Engelhardt), in the writer's collection.

Allotype: Female, same data, in the writer's collection.

Paratypes: 8 males and 7 females, same data and 1 female, Southern Pines, N. C., September 13, 1937 (G. P. Engelhardt), in the writer's collection.

Very similar to *politus* Loew, differing mainly by the characters given in the key; in male *politus* the fifth abdominal segment is two and three-fourths times as broad as long and the sixth segment appears black in ground color.

Nicocles pollinosa, new species.

Male: Length 10 mm. Head black and entirely whitish pollinose. Mystax, antennal hairs and bristles, and bristles on ocellar tubercle and upper occiput yellowish; hairs otherwise white. Antennae black, grayish pollinose, first two joints subequal in length, the third nearly twice the length of the first two joints together, style nearly half the length of the third joint.

Thorax black, white pollinose, the broadly interrupted central stripe and the lateral spots brownish black. Hairs white; bristles yellowish-red, 3–4 presutural, 2–3 supraalar, 2–4 postalar, and 3 dorsocentrals. Scutellum white pollinose and dense long white haired with two pairs of weak yellowish apical bristles. Pleura and coxae white pollinose and white haired.

Abdomen black, sides of the first segment and segments 2–5 with an anterior transverse band occupying about one-third of each segment, white pollinose; sixth segment wholly silvery. Hairs and bristles white. Venter white pollinose, with small dark-brown spots, hairs white. Genitalia black, white haired.

Legs black, the hind femora below, the fore tibiae, and the middle and hind tibiae posteriorly yellowish. Hairs white, bristles brown, claws black, pulvilli brown.

Halteres dark brown. Basal third of wings hyaline, except extreme base, which is brownish; outer two-thirds brown villous with large clear spots in the subcostal, marginal, and first, third, and fourth posterior cells; remaining cells with either smaller spots or with clear areas along the veins. Veins dark brown, anterior crossvein at four-sevenths the distance from base to apex of discal cell.

Holotype: Male, Flathead Lake, Flathead County, Montana, September 3, 1934 (William L. Jellison), in the writer's collection.

Paratype: Male (without head) Creighton Valley, Lumby, B. C., April 24, 1934 (H. B. Leech), in the writer's collection,

The fifth abdominal segment is two and one-half times as broad as long. The lighter areas on the legs are reddish brown and the bristles on the tibiae are yellowish white except at apex. The light pollen of the thorax and abdomen is grayish and the dark pollen of the mesonotum is golden brown. What remains of this specimen is apparently mature, while the holotype is somewhat teneral. The anterior pollinose bands on abdominal segments 2–5 separate this from the other species.

On Two Species of Oxybelus at Washington, D. C. (Hymenoptera, Sphecidae).—Several years ago I recorded in the pages of this journal the occurrence in this country of the common European wasp *Oxybelus bipunctatum* Olivier from one specimen taken on Long Island and another at Ithaca, N. Y. This pretty little wasp may now be considered an established member of our fauna, for two enthusiastic young entomologists of Washington, Morton Vogel and David Shapirio, have observed it nesting in considerable numbers in Rock Creek Park, Washington, D. C., throughout the summer of 1945. On July 24, 1945, Morton Vogel captured a female *O. bipunctatum* with its prey, the Stratiomyid fly *Microchrysa polita* (Say) [det. Greene]. A number of specimens of the relatively rare *Oxybelus subcornutum* Cockerell, originally described from Las Cruces, New Mexico, were likewise taken in Rock Creek Park during July and August by Messrs. Vogel and Shapirio; a female, taken September 11, 1945, by Morton Vogel, was carrying as its prey a male Syrphid fly, *Allograpta obliqua* (Say) [det. Greene].—V. S. L. Pate.

THE PHOTOGRAPHY OF TYPES OF LEPIDOPTERA.

By Cyril F. dos Passos,* Mendham, N. J.

The importance of photographing type specimens of Lepidoptera *with the labels attached* is self-evident. Photographs of insects without the labels are of little scientific value. In the natural course of events and even with the best of care, it is doubtful whether types of Lepidoptera will last many hundred years. There are many risks incidental to the handling of types. Other hazards, such as war, fire and various acts of God, tend to render their preservation uncertain. On the other hand, negatives and prints of types should last almost indefinitely. They may be reproduced when necessary, exchanged between museums and supplied to students for scientific study. In many cases the photographs are as satisfactory as the types. Their use often makes the handling of type specimens unnecessary.

J. D. Gunder appears to have been the first person to design and use a compact, portable outfit to photograph types of Lepidoptera. In a paper by him entitled "A New Insect Camera of Compact Design" (Can. Ent., 62: 215, 1930) will be found a half-tone of his outfit and a picture taken with it. The title of the paper is rather broader than the results which may be satisfactorily obtained. All insects cannot be photographed so as to show clearly their taxonomic characters, but those having flat surfaces, such as Lepidoptera, are easily and usefully photographed.

The Gunder apparatus had certain obvious defects. In the first place, the illumination being very close to the lens of the camera resulted in bad reflections and cast unsightly shadows on the background; secondly, the pin holder was unnecessarily large and clumsy; and thirdly, the label holder could not readily accommodate the large number of labels which are often found on types.

The apparatus herein described and figured obviates all of these difficulties. The two photoflood bulbs in reflectors are mounted on arms folding close to the apparatus when not in use, but extending to any desired angle when photographs are being taken. Thus there are no reflections nor shadows behind the insect. Instead of a pin holder, the point or head of the pin on which the insect is mounted (depending upon which side is being photographed) is stuck into a very small lump of modeling clay, affixed to a piece of ground glass. This modeling clay lasts a long while and never loosens from the glass. It is hidden from view by the body of the insect. The piece of ground glass with the smooth side toward the camera fits into a groove and may be removed in order to pin the insect to it. Behind the glass is a white, silk screen and in back of that a gooseneck table lamp with a frosted bulb. The screen is removable and may be replaced by a black screen if a light-colored insect is to be photographed. The back light also helps to kill all shadows and gives an artistic background to the picture. The labels are pinned with minuten nädel pins on a thin piece of balsa wood, painted black or white. This wood, cut into several sizes, easily holds a number of labels. The pins, including the one holding the insect, being head on to the camera, show merely as dots on the photograph. The piece of balsa wood, which is removable for pinning the labels to it, is held by a clip, such as used to hold negatives while drying. In turn, the clip is mounted on an upright column and may be moved up or down to bring the labels directly under the insect.

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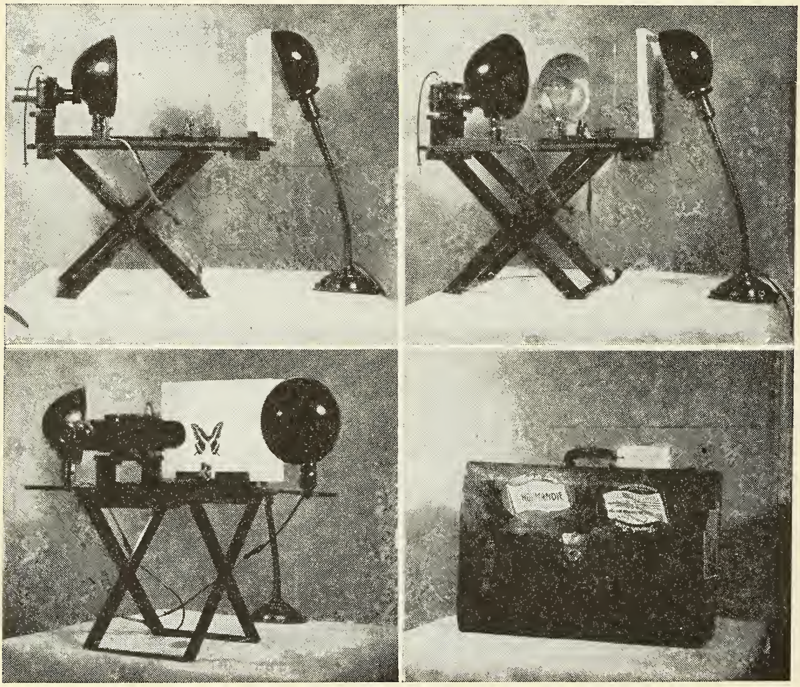
* Research Associate, The American Museum of Natural History.

The camera used is a Leica Model F with an Elmar 50 mm. f: 3.5 lens stopped down to f: 9 to give greater depth of focus and to allow for minor errors in focusing. The time of exposure is determined by a Leicameter. With two photoflood bulbs the exposure is usually about 1/30 of a second. The camera and lens are mounted on opposite sides of a Sliding Focusing Copying Attachment, manufactured by E. Leitz, Wetzlar, Germany, which is supported at the proper height by a wooden base. The camera may be slid sideways from the lens for focusing on a ground glass, but it is not necessary to focus each time a picture is taken unless a very large insect is to be photographed. In that case the lens is somewhat retracted and the label holder pushed slightly away from the camera. Otherwise the column holding the label holder, which can be moved backward or forward independently of the glass and screen holder, is placed at a predetermined distance from the camera where the label is in sharp focus, and only the glass and screen holder need be moved back or forth (because of the different heights of insects on pins) until the insect is directly over the label. Then it too is in sharp focus. The insect, when photographed with the lens fully extended, is about one quarter natural size and the prints are enlarged four times to give a natural sized picture of the insect.

Any fine-grain film with a wide color sensitivity may be used. Agfa Finopan, DuPont Parpan and Kodak Panatomic-X in thirty-six exposure rolls have given excellent results. A color film, theoretically, would be ideal but none thus far tried seems to reproduce all colors correctly for scientific work, where the exact colors are of vital importance. Furthermore, it is very much more expensive and prints are not easily made.

The accompanying figs. 1–4 show the apparatus perhaps better than words can describe it. It will be noted that the device rests on a folding support, although it may be set directly on a table. It has been found, however, that it is easier to work standing up; hence the support which raises the apparatus to a convenient height.



Explanation of Figures.

Fig. 1. Side view with the arms folded.

Fig. 2. Side view with the arms extended.

Fig. 3. View from the photographer's position.

Fig. 4. Bag which accommodates the entire equipment, extra films, bulbs, etc.

With the apparatus herein described, photographs have already been taken of the types of North American Rhopalocera and some Heterocera in the Academy of Natural Sciences of Philadelphia, The American Museum of Natural History, the British Museum (Natural History), the Canadian National Collection, the Carnegie Museum, The Linnean Society of London, the Muséum National d'Histoire Naturelle, the Zoological Museum, Tring, and others. In all, about twelve hundred types have thus far been photographed. It would be desirable to extend this work to include all Lepidoptera. If every museum would do its share, a collection of photographs possibly ninety per cent complete could be gathered together, and by the exchange of prints become available in all parts of the world. The expense is trivial compared with the results obtained.

In conclusion I desire to acknowledge with sincere appreciation my obligation to the late Dr. Frank E. Lutz, Chairman and Curator of the Department of Insects and Spiders of The American Museum of Natural History, for valuable suggestions respecting the designing of the apparatus, and to the late Henry Abelspies of Mendham, New Jersey, for its actual construction in accordance with my plans and specifications.

Pigmy Mole Cricket.—A large "colony" of the minute mole cricket, *Tridactylus minutus* Scudder (det. Dr. H. K. Townes) was encountered at Arches National Monument, Grand County, Utah, on August 31, 1942. Approximately 150 to 200 of these pigmy mole crickets were on a damp patch of sand 12 to 20 inches wide and approximately 48 inches long. A few others were within 24 inches of this moist spot; none was observed elsewhere. Moisture to wet the sand came from a leak in a livestock watering trough, fed by a pipe supplying a constant small trickle of water.

In approximately five minutes of sweeping with an insect net, 34 *T. minutus* were collected. Mr. Walter E. Peay, who also was present, collected a few specimens and captured a small lizard, *Uta stansburiana stansburiana* (B.-G.). The stomach of this lizard contained 2 of the tiny crickets; it also held 1 leafhopper; 3 beetles, of which one was a weevil and one a flea-beetle; and one muscoid fly.—George F. Knowlton, Utah State Agricultural College, Logan.

NOTE ON THE DIRECTION OF FLIGHT OF BUTTERFLIES IN NORTHERN FLORIDA.

By William Hovanitz, Ann Arbor, Mich.

A census was taken of the direction of flight of butterflies across the campus of the Florida State College for Women at Tallahassee, Florida, on October 30, 1944. For about a week prior to this time, there was noticed a marked tendency of nearly all butterflies in the region toward mass movements. This had followed the occurrence of a change in climate a few weeks previously, from the hot and sultry Gulf coast condition to a dryer and cooler continental condition, apparently correlated with the shifting of the air mass movements at this time of year.

Prior to the change in climate, most species of butterflies seemed sedentary. Afterwards for several weeks, a great number assumed a migratory aspect and were on the move, generally in a southward direction.

The following list represents the species seen and the number of each counted within the period of one-half hour (1:45–2:15 P.M., E.W.T.):

	North	East	South	West
Heliconius charithonia	1	..	..	..
Phoebis eubule	3	17	70	4
Colias eurytheme	..	..	2	..
Eurema nicippe	..	..	4	..
Eurema lisa	..	..	4	..
Zerene caesonia	2	..	2	..
Dione vanillae	..	..	12	..
Danaus plexippus	..	1	1	..
Junonia lavinia (*coenia*)	2	..	1	..
Eudamus sp.	..	1	8	..
Combined total	8	19	104	4

All species were flying swiftly over the terrain except the *Heliconius* and the *Junonia lavinia* which maintained local short flights as under normal conditions.

Special mention should be made of *Colias eurytheme* (the orange alfalfa butterfly). This species was not observed at all during the months of September and most of October in the vicinity of Tallahassee and Chattahoochee, Northern Florida. It did not appear until this general southern flight was observed and at least two weeks after the onset of the climatic change. The specimens were of the phenotype expected when bred under warm and humid conditions. Dates of observation are:

Oct. 27, 1944.	Orange female laying eggs on clover.
Oct. 29, 1944.	Orange female flying.
Oct. 30, 1944.	White female flying south. Orange female flying south.
Nov. 9, 1944.	Two orange females flying and laying eggs.

No males were observed.

The point of this note is that Florida is on the extreme southern limits of temperature tolerance for *Colias eurytheme.* It seems to be absent in the summer and may only be reintroduced by southward migrations in the fall. The clover used as food by the larvae does not seem to be in growing condition until the onset of the cooler season. The only *Colias* specimens seen were females, and female *Colias* are more migratory than males. Museum material records that males are present in the springtime at Monticello (20 mi. east of Tallahassee). Complete seasonal studies should be made in order to determine more precisely the nature of the presence of *Colias* in this region.

"THAN"—WHAT?

"Species of mediun size." How long is a piece of string?

In a key—contrasting characters(!?) "Antennae more slender" than what?

"Antennae shorter, more swollen" than what?

A generic characterization: "Differs from the other genera in the tribe in its longer, more parallel body, shorter legs, and armed hind femora. From its nearest ally *Exus* (an alias to conceal identity), by the long simple or slightly forked veins."

"Longer" than what? "More parallel" than what? "Shorter legs" than what?

J. R. T.-B.

CATALOGUE OF THE TYPES OF GENERA AND SUBGENERA OF PSYCHODIDAE.

By William F. Rapp, Jr., Urbana, Ill.

In recent years radical changes have taken place in the nomenclature of Psychodidae, because the number of genera has grown from less than a dozen to 66. The majority of these new genera were erected by Doctor Gunther Enderlein, who, in my opinion, is slightly confused as to what constitutes generic characters. The late A. L. Tonnoir admirably summed up Enderlein's "Klassifikation der Psychodiden"[1] as follows: "As usual with this author, generic subdivision is carried to absurd lengths."[2]

The genotypes given in this catalogue have been chosen after a careful study of the original descriptions.

Subgenera are designated by an asterisk.

Alepia Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 94.
  Type: *A. scripta* Enderlein 1936.
Bruchomyia Alexander
  Ann. Ent. Soc. Amer., Vol. 13 (1920), p. 405.
  Type: *B. argentina* Alexander 1920.
**Brumptomyia* Franca & Parrot
  Arch. Inst. Pasteur Afrique du Nord., Vol. 1 (1921), p. 283.
  Type: *B. brumpti* (Larrousse 1920).
Brunettia Annandale
  Rec. Indian Museum, Vol. 5 (1910), p. 141.
  Type: *B. superstes* (Annandale 1908).
Chirolepia Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 103.
  Type: *C. maculipennis* Enderlein 1936.
Clogmia Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 103.
  Type: *C. albipennis* (Willist. 1893).
Clytocrus Eaton
  Ent. Mon. Mag., Vol. 40 (1904), p. 59.
  Type: *C. ocellaris* (Meig. 1804).

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[1] Enderlein, G. 1937. Klassifikation der Psychodiden (Dipt.). Deutsch. Ent. Zeitschr., 1936: 81–112.

[2] Tonnoir, A. L. 1940. A Synopsis of the British Psychodidae (Dipt.). Trans. Soc. British Ent., Vol. 7 (1940), p. 62.

Colpopteryx Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 84.
Type: *C. undulata* (Tonnoir 1919).

Desmioza Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 99.
Type: *D. edwardsi* (Tonnoir 1929).

Dictyocampsa Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 100.
Type: *D. guttata* Enderlein 1936.

Didicrum Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 105.
Type: *D. griseatum* (Tonnoir 1929).

Diplonema Loew
Dipterolog. Beitr. I. (1845), p. 7.
Type: *D. buceras* Loew.

Eophlebotomus Cockerell
Ann. Mag. Nat. Hist. (9), Vol. 6 (1920), p. 212.
Type: *E. connectens* Cockerell.
This is a fossil genus.

Flebotomus Rond.
Mem. Prima Serv. Dipt. Ital., p. 12, 1840.
Type: *F. papatasii* (Scop. 1786).
This is spelled *Phlebotomus* by many workers. Agassiz in 1846 changed the spelling to Phlebotomus because he believed the original name Flebotomus had been incorrectly translated from the Greek. See Rapp, Science, Vol. 99 (1944), p. 345; Vol. 100 (1944), p. 124.

Horaiella Tonnoir
Rec. Indian Mus., Vol. 35 (1933), p. 54.
Type: *H. prodigiosa* Tonnoir.

Kupara Rapp
J. N. Y. Ent. Soc., Vol. 53 (1945), p. 310
Type: *Kupara albipeda* Rapp.

Lepidiella Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 89.
Type: *L. lanuginosa* Enderlein.

Lepimormia Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 98.
Type: *L. tatrica* Enderlein.

Lepipneumia Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 92.
Type: *L. latefasciata* Enderlein.

Lepiseoda Enderlein
Sitz. Ber. Ges. Naturf. Fr. Berlin, 1935, p. 247.
Type: *L. notabilis* (Eaton).
Enderlein (Deutsch. Ent. Zeitschr., 1936, p. 95) considers this a synonym of *Panimerus* Eaton.

Lepiseodina Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 93.
Type: *L. tristis* (Meigen).

Lepria Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 112.
Type: *L. squamosa* Enderlein.

Longima Eaton
Ent. Mon. Mag., Vol. 40 (1904), p. 58.
Type: *L. erminea* (Eaton).

**Lutzia* Franca
Bull. Soc. Portugaise Sci. Nat., Vol. 8 (1920), p. 234.
Type: *P. longipalpis* (Lutz and Neiva).
Enderlein (Deutsch. Ent. Zeitschr., 1936, p. 110) says this is a synonym of *Lutzomyia* Franca.

**Lutziola* Strand
Folia Zool. Hydrobiol., Vol. 4 (1932), p. 195.
No type was designated by Strand when he proposed this name. He gave no reason for doing so. The following quotation is from the above reference: "Lutzia (als Subgen. zu Phlebotomus H. Loew) Franca, Bull. Soc. Portugaise Sci. Nat., 8. fasc. 3, p. 234 (1920), nenne ich Lutziola Strand n.n. (Psychodidae)." I consider the type to be *P. longipalpis* (Lutz and Neiva).

**Lutzomyia* Franca
J. Sci. Mat. Phys. Nat. Lisboa (3), Vol. 5 (1927), p. 23.
Type: *L. argentipes* (Annandale & Brunetti).

Marzypia Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 84.
Type: *M. plumata* (Tonnoir).

Maruinini F. Mull.
Trans. Ent. Soc. London, 1895, p. 480.
Type: *M. pilosella* F. Mull.

Mecysmia Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 108.
Type: *M. schoenemanni* Enderlein.

Microdixa Muller
Z. Morp. Oekol. Tiere, Vol. 7 (1927), p. 535.

Type: *M. similis* Muller.
Edwards (Entomologist, Vol. 61 (1928), p. 207) says that this is a synonym of *Sycorax*.

Mogisetia Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 94.
Type: *M. albifacies* (Tonnoir).

Mormia Enderlein
S. B. Ges. Naturf. Fr. Berlin, 1935, p. 248.
Type: *M. revisenda* (Eaton).

Nemoneura Tonnoir
Dipt. Patag. & S. Chile, Vol. 2, p. 27 (1929).
Type: *N. punctata* (Phil.).

Nemopalpus Macq.
In Webb & Berth, Hist. Nat. I. Iles Canaries, Ent. Dipt., p. 101, 1838.
Type: *N. flavus* Macq.

**Newsteadia* Franca
Broteria (Ciencias naturais), Vol. 17 (1919), p. 148.
Type: *N. papatasii* (Scopoli).
Enderlein (Deutsch. Ent. Zeit., 1936, p. 109) considers this genus a synonym of *Sergentomyia* Franca.

Notiocharis Eaton
Trans. Linn. Soc. London (2), Zool., Vol. 16 (1913), p. 427.
Type: *N. insignis* Eaton.

Panimerus Eaton
Trans. Linn. Soc. London (2), Zool., Vol. 15 (1913), p. 425.
Type: *P. scotti* Eaton.

Parabrunettia Brunetti
Rec. Ind. Mus., Vol. 4 (1911), p. 311.
Type: *P. indica* (Eaton).

Paramarmia Enderlein
S. B. Ges. Naturf. Fr. Berlin, 1935, p. 248.
Type: *P. fratercula* (Eaton).

Pericoma Walker
Insecta Brit., Vol. 3, p. 256, 1856.
Type: *P. trifaciata* (Meigen).

Pericomina Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 85.
Type: *P. opaca* (Tonnoir).

Peripsychoda Enderlein
S. B. Ges. Naturf. Fr. Berlin, 1935, p. 248.
Type: *P. fusca* (Macq.).

**Philosepedon* Eaton
  Trans. Linn. Soc. London, Vol. 15 (1904), p. 429.
  Type: *P. humeralis* (Meigen).
Platyplastinx Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 107.
  Type: *P. solox* Enderlein.
Pneumia Enderlein
  S. B. Ges. Naturf. Fr. Berlin, 1935, p. 247.
  Type: *P. palustris* (Meigen).
Podolepria Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 105.
  Type: *P. inornata* (Tonnoir).
**Prophlebotomus* Granca & Panot
  Arch. Inst. Pasteur Afrique du Nord, Vol. 1 (1921), p. 282.
  Type: *P. perturbans* (Meijere).
Psychoda Latr.
  Précis. l. caract. gener. I. Ins.
  Type: *P. phalaenoides* (Linné).
Saccopteryx Haliday
  In Curtis, Guide arrang. Brit. Ins., 1838, p. 24.
  Type: *S. fuliginosa* (Meigen)?
  This is a synonym of *Timearia* Schellenberg.
Sciria Enderlein
  S. B. Ges. Naturf. Fr. Berlin, 1935, p. 247.
  Type: *S. advena* (Eaton).
**Sergentomyia* Franca
  Bull. Soc. Portugaise Sci. Nat., Vol. 8 (1920), p. 234.
  Type: *P. minutus* Rondani.
Seoda Enderlein
  S. B. Ges. Naturf. Fr. Berlin, 1935, p. 248.
  Type: *S. labeculosa* (Eaton).
Setomima Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 100.
  Type: *S. lithocolleta* Enderlein.
**Shannonomyia* Dyar
  Amer. J. Hyg., Vol. 10 (1927), p. 117.
  Type: *S. panamensis* (Shannon).
Sycorax Haliday
  In Curtis, Brit. Ent., Vol. 16 (186), No. 745, 1838.
  Type: *S. silacea* Curtis.
Synmormia Enderlein
  Deutsch. Ent. Zeitschr., 1936, p. 99.
  Type: *S. chilensis* (Tonnoir).

Synseodais Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 92.
Type: *S. flavitarsis* Enderlein.
Syntomolaba Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 100.
Type: *S. complicata* (Tonnoir).
Syntomoza Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 88.
Type: *S. niveitarsis* Enderlein.
Telmatoscopus Eaton
Ent. Mon. Mag., Vol. 40 (1904), p. 58.
Type: *T. morula* (Eaton).
**Threticus* Eaton
Ent. Mon. Mag., Vol. (1904), p. 57.
Type: *T. lucifugus* (Walker).
Thyrsocanthus Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 103.
Type: *T. stellulatus* (Loew).
Tinearia Schellenberg
Gattugen der Fliegen Zürich, 1803, Tafel 40.
Type: *T. fuliginosa* (Meigen).
Tonnoira Enderlein
Deutsch. Ent. Zeitschr., 1936, p. 106.
Type: *T. pelliticornis* Enderlein.
Trichomyia Haliday
In Curtis, Brit. Entom., Vol. 16 (186), No. 745, 1838.
Type: *Trubica* Curtis.
Trichopsychoda Tonnoir
Ann. Soc. Ent. Belgique, Vol. 62 (1922), p. 59.
Type: *T. hirtella* (Tonnoir).
Ulomyia Walker
Insecta Brit., Vol. 3 (1856), p. 261.
Type: *U. hirta* (Fab.).
Enderlein (Deutsch. Ent. Zeitschr., 1936, p. 84) says this is a synonym of *Tinearia* Schellenberg.
Xenapathes Eaton
Ent. Mon. Mag., Vol. 40 (1904), p. 59.
Type: *X. fraudulenta* Eaton.

ODONATA COLLECTED AND OBSERVED IN 1945 AT TWO ARTIFICIAL PONDS AT UPTON, NEW JERSEY.

By George H. Beatty, III, Merion, Pa.

During the Spring and Summer of 1945, the writer often collected insects of various orders in the Pine-barren region of New Jersey. On seven different days between May 20 and August 12, dragonflies were collected at two ponds near Upton station on the Pennsylvania Railroad, Long Branch Division. All of the thirty-six species in the following list were actually captured or unmistakably recognized over the water or banks of the ponds. In the same neighborhood many interesting species have been taken, some within a few hundred yards and others as much as three miles away. These include *Progomphus obscurus, Gomphaeschna furcillata, Cordulegaster maculatus, Tetragoneuria semiaquea, Dorocordulia lepida, Libellula flavida, Agrion apicale,* and *Nehalennia gracilis.* They are not included, however, since they do not form part of the immediate fauna of the ponds themselves. Records of their occurrence and notes on their ecology are being published elsewhere.

The two ponds at Upton were created in 1931 when sand was excavated to build the approaches of a highway bridge across the railway, and are very close to both the railway and the heavily travelled highway. Their combined area, including the narrow sandy strip separating them, is about seven acres and they vary in depth from one to six feet. The smaller pond is fed by springs near its center and the larger one by seepage from an adjoining cedar swamp. The water of the latter pond is the color of strong tea and the entire pond is of quite different character than the smaller spring-fed one. It contains no submerged vegetation and very few emergent plants, while the banks are overgrown with *Kalmia, Vaccinium,* and similar woody shrubs. On the other hand, the smaller pond is fairly choked with submerged and, in the shallow portions, emergent vegetation and the banks are grassy. The bottoms of both are of white sand and small pebbles and there are narrow sandy beaches at various points about their periphery. Since some of the following species display a marked preference for one pond or the other, the designation "cedar pond" and "clear pond" will be used to indicate the immediate environment of such species. Other dragonflies were found only or chiefly in parts of the area between the ponds which were flooded by water from the cedar pond. Here were grasses, sedges, cranberry, *Smilax, Kalmia,* *Vaccinium,* small oaks and pines, growing in water from four to twelve inches deep. These places cannot be considered as part of the pond since their vegetation is exactly the same as that of all the dry land nearby. In the protection of this vegetation such delicate species as *Nannothemis bella, Nehalennia integricollis,* and *Anomalagrion hastatum* were found, and one species *Libellula semifasciata* was seen nowhere else.

On some visits, only a few hours in the forenoon were spent at the ponds, while on other dates they were also thoroughly searched in the afternoon.

In parentheses, following the name of each collected species, have been entered the specimens actually collected by the writer. In the case of the Anisoptera, these data cannot be considered an index to the abundance of a species because some, like *Anax longipes, Libellula auripennis,* and *Tramea carolina* proved difficult to catch, and others, such as *Anax junius, Libellula pulchella,* and *Sympetrum vicinum* were of little interest to the collector. However, in the Zygoptera, especially the genus *Enallagma,* the number of specimens collected is an accurate indication of the absolute and relative abundance of the various species.

Gomphus exilis Selys (1♀—24.VI; 1♂—30.VI; 1♀—8.VII). These specimens, measuring respectively 35, 37, and 36 mm. in total length, are much smaller than examples of the same species taken near a stream a few miles away. The first ♀ was taken as it hovered over the grassy bank of the clear pond and on the same day a ♂ was seen resting on a floating timber. The other two specimens were secured when they were found squatting on the sandy beaches of the cedar pond. These four individuals were the only ones seen.

Anax junius Drury. This species was noted frequently throughout the season. Coupled pairs were often seen ovipositing as they perched on emergent grasses.

Anax longipes Hagen (1♂—24.VI; 1♂—29.VI; 1♂—30.VI; 1♂—8.VII). *Longipes* was surprisingly abundant on some days, sometimes far exceeding *junius* in point of numbers. It was seen in greatest numbers on 29.VI when it was noted that only *C. elisa, C. martha, P. longipennis,* and *T. carolina,* among the Anisoptera, were more numerous. On this date, two unattached ♀'s were seen ovipositing in shallow water. One was unattended and the second had several ♂'s hovering over her for a moment, but they disappeared before she had finished her task. Each ♀ clung to floating plants and curved the distal half of her abdomen into water in the same manner as *junius*. The species was seen also on 22.VII and on 12.VIII.

Nannothemis bella Uhler (4♂—24.VI; 2♂—29.VI; 4♂—8.VII). Taken at the edges of both ponds where tall grasses and sedges offered concealment. No ♀'s were seen.

Perithemis domita Drury. One ♂ was seen at the cedar pond on 12.VIII.

Celithemis elisa Hagen (3♂, 2♀—24.VI; 3♂, 2♀—29.VI; 2♂, 1♀—30.VI; 4♂—8.VII; 2♂, 2♀—22.VII; 2♂—12.VIII. Very abundant on every visit except 20.V, when it was not seen. On 29.VI, it was emerging in large numbers at the clear pond and ovipositing pairs were common everywhere.

Celithemis martha Williamson (5♂, 1♀—24.VI; 3♂, 1♀—29.VI; 2♂, pr. in cop.—30.VI; 8♂, 4♀—8.VII; 2♂—22.VII; 5♂—12.VIII). This species was found to be just as abundant as *C. elisa* on every occasion. Teneral ♂'s have never been seen. Indeed, most of the ♂'s collected, even on the earliest dates, appeared to be quite old, while most of the ♀'s were teneral. The only old ♀'s taken were in cop. with ♂'s. As late as 12.VIII, teneral ♀'s were very abundant at nine o'clock in the morning but were not seen later in the day.

Celithemis ornata Rambur (1♀—29.VI). This species, not previously known from any state north of North Carolina, is evidently a stray and not part of the normal fauna. What is presumed to have been the same individual was seen on 24.VI and was noted then to be very old. On both dates, *ornata* flew among the emergent plants in a shallow bay of the clear pond.

Erythrodiplax berenice Drury (1♂—22.VII). This single individual is probably a wanderer from its normal habitat in the brackish coastal marshes.

Libellula deplanata Rambur. A few of this species were seen at the ponds in June. It was abundant at other smaller ponds and ditches nearby.

Libellula auripennis Burmeister (1♀—29.VI). This was seen also on 24.VI, 30.VI, and 12.VIII. On the two latter dates, ♂'s were seen in considerable numbers, but were extremely difficult to capture. In the flooded area between the ponds it was most abundant, flying with *L. semifasciata* and showing great activity.

Libellula semifasciata Burmeister. Seen only in the grassy flooded area between the ponds, where it occurred in considerable numbers, on 29.VI, 30.VI, 8.VII, and 12.VIII. Its numbers were not at all diminished on the latter date.

Libellula pulchella Drury. This species was seen in small numbers about both ponds on most occasions when they were visited. It was more abundant on later dates.

Libellula incesta Hagen (1♂—30.VI). This individual was the only one of the species which has been seen. It was flying with *P. longipennis* and perching on the tips of bare branches of bushes only a few feet from the highway. *Longipennis* repeatedly drove *incesta* from its perch.

Libellula lydia Drury. Only one or two individuals of this omnipresent species have been seen at the Upton ponds.

Sympetrum vicinum Hagen. Although seen nearby on 22.VII, this species was not seen at the ponds until 12.VIII, when it occurred in swarms about *Vaccinium* bushes growing in the water at the eldge of the cedar pond. All of those examined were teneral or juvenile but were flying about quite energetically. Many scattered individuals were seen everywhere about the ponds and throughout the pine woods, where mature specimens were taken.

Leucorrhinia intacta Hagen. A single individual was seen at the cedar pond on 24.VI.

Leucorrhinia frigida Hagen (1♂—24.VI). This is the southernmost outpost of this characteristically northern species which flew with *P. longipennis* among the emergent plants in a shallow bay of the clear pond. Its flight was much weaker than that of *intacta.*

Pachydiplax longipennis Burmeister (2♂—8.VII; 1♀—12.VIII). Always one of the most abundant of the Anisoptera, *longipennis* proved to be thoroughly annoying to the collector because of its presence everywhere and because it frequently darted at, and drove away, resting dragonflies just as the net-stroke was to be made to capture them. Exceedingly abundant during June, this species decreased in numbers during July and was seen only in small numbers in August.

Erythemis simplicicollis Say (2♂, 1♀—8.VII). Seen also on 29, 30.VI, 22.VII, and 12.VIII, but never in large numbers. It occurred only in the flooded grassy area between the ponds, where it flew close to the ground or water with a slow hovering flight with occasional quick darts.

Pantala flavescens Fabricius (1♂—24.VI). Another was seen on 24.VI.

Tramea carolina Linnaeus (1♂—20.V; 2♂—29.VI; 1♂—12.VIII). This species was seen on every visit from 20.V and was very abundant on 24.VI, 29, 30.VI, 8.VII, and 22.VII. On 29, 30.VIII, ovipositing pairs were common, the ♂ usually releasing the ♀ during the actual egg-laying and again seizing her when she rose from the water. On 12.VIII, the species was seen in much smaller numbers.

Lestes forcipatus Rambur. A single ♂ of this species was taken on 24.VI at the clear pond by my companion, Mr. John Gillespie.

Lestes vigilax Hagen (3♂, 1♀—24.VI; 6♂, 1♀—29.VI; 7♂—30.VI; 4♂, 2♀—8.VII; 1♀—22.VII; 2♂, 3 prs. in cop.—12.VIII). This species is one of the commonest of the Zygoptera at Upton. In June and early July, it was exceeded only by *Enallagma pictum,* but on 12.VIII, when *pictum* had almost disappeared, *vigilax* was more abundant than ever before, many coupled pairs being seen at both ponds, but more commonly at the cedar pond.

Argia violacea Hagen (2♂—24.VI; 2♂—29, 30.VI; 7♂—8.VII; 1♂—22.VII; 1♂—12.VIII). This species was quite common about *Kalmia* bushes at the edge of the cedar pond, but there was no trace of it at the clear pond on any occasion, nor were any ♀'s seen.

Nehalennia integricollis Calvert (1♂—12.VIII). The only one of this species which has been seen flew very delicately below the tops of the grasses in the flooded area between the ponds.

Enallagma divagans Selys (1♂—24.VI). This is the only specimen of *divagans* which has been collected at the ponds. It was taken in a shallow bay of the clear pond where there is much emergent vegetation.

Enallagma recurvatum Davis. A single ♂ which has been identified as this species was collected by Mr. John Gillespie on 24.VI.

Enallagma pictum Morse (4♂, 11♀—24.VI; 4♂, 8♀—29.VI; 5♂, 6♀—30.VI; 1♂, 1 pr. in cop.—8.VII; 1♂—12.VIII). In late June and early July, *pictum* was the most abundant of the Zygoptera, if not the most abundant dragonfly, but decreased sharply in numbers after 8.VII. It was found in greatest abundance about the emergent vegetation of the clear pond.

Enallagma doubledayi Selys (1♂—24.VI; 2♂—29.VI; 5♂—8.VII; 1♂—12.VIII). This species occurred chiefly at the cedar pond and flew in close association with *E. civile, E. aspersum,* and *L. vigilax.* With the two former species, it flew close to the water's surface and alighted on the emergent plants very close to the water. It was extremely active and wary. Three ♀'s taken on 24.VI and one ♀ taken on 8.VII probably belong to this species or the following.

Enallagma civile Hagen (1♂—22.VII; 1♂—12.VIII). This species has been taken at both ponds but is quite rare. At the cedar pond it flies with *E. doubledayi,* from which is cannot be distinguished on the wing.

Enallagma aspersum Hagen (2♂—29, 30.VI; 7♂—8.VII; 11♂—12.VIII). Except for *E. pictum,* this is the commonest *Enallagma,* and on 12.VIII, when *pictum* was very scarce, *aspersum* had reached its peak abundance. This species flies and alights less than an inch from the surface of the water. If disturbed while at rest, it often dashes far out over the water, seeming to be skating on the surface, and sometimes dipping into the water. It has been taken at both ponds but is decidedly more abundant at the cedar pond where it frequents large patches of open water where there are a few grass-stems to alight upon.

Enallagma traviatum Selys (1♂—29.VI). Except for another ♂ collected by Mr. Gillespie on 24.VI, only this single specimen of *traviatum* has been taken. ♀'s of this and the preceding three species of *Enallagma* have not been met with, except as noted under *E. doubledayi.*

Ischnura posita Hagen (1♂—24.VI). Seen only occasionally at the ponds, though frequently collected nearby.

Ischnura verticalis Say (6♂, 8♀—20.V; 1♂—24.VI; 2♂, 1♀—29, 30.VI; 1♂—8.VII; 1♀—22.VII; 1♂, 2♀—12.VIII). This species was very abundant on 20.V and has since been seen in greater or lesser numbers. On 12.VIII, it was decidedly scarce, only three or four individuals of each sex being noted.

Anomalagrion hastatum Say (6♂, 7♀—24.VI; 2♂, 5♀, 1 pr. in cop. 29, 30.VI; 3♂, 7♀—8.VII; 2♂, 1♀—22.VII; 13♂—12.VIII). On 24.VI and 29, 30.VI, ♀'s of this species were much more abundant than the ♂'s. On 12.VIII, ♂'s, most of them teneral, were extremely numerous everywhere. Only one coupled pair of this species has been taken. The ♂'s evidently become more abundant late in the afternoon, as nearly all of those collected on 12.VIII were taken at about six o'clock. They fly throughout the day, however, and two ♂'s were taken at 7:30 in the morning on 30.VI.

From the foregoing notes many conclusions may be drawn, though few of them are of great significance. Only continued study over a period of years, from beginning to end of the dragonfly season, including the larval as well as the adult stages, can be the basis of valid general conclusions on the ecology of any population of these insects. However, the following conclusions, based as they are upon the facts here presented, may be of some interest.

1. The odonate fauna of the ponds can be divided into two groups, one containing the larger anisopterous species with considerable powers of sustained flight, and the other including the small, delicate Anisoptera such as *Nannothemis bella* and all of the Zygoptera. It is natural that members of the first group should soon take up residence in a newly-created pond, but the presence of members of the other group is less easily explained. A rather thorough reconnaissance of the surrounding territory disclosed no nearby habitat suitable to even a small percentage of the species in the second group. Along nearby cedar streams, *Argia violacea* was found, while *Nannothemis bella, Lestes vigilax, Enallagma pictum, Ischnura posita* and *verticalis,* and *Anomalagrion hastatum* were found in and near cranberry bogs about three miles away. The other Zygoptera were found nowhere in the immediate territory except at the two Upton ponds. Although some species show certain migratory tendencies, it is not likely that all the species of the second group flew, of their own volition, through three or more miles of dense pine woods to take up residence at the ponds, nor is it likely that their larvae were carried there by watercourses since the ponds are not fed by streams and most of the species in question are considered pond insects. The logical explanation is that either fertilized females or individuals of both sexes of each species were carried from greater or lesser distances by strong winds, to the pond or its immediate vicinity. Some of the species, such as *Celithemis ornata, Erythrodiplax berenice, Leucorrhinia frigida,* and *Enallagma traviatum* may have been carried for very great distances and may possibly represent new arrivals of this season. Other species have doubtless been there since shortly after the ponds were created. Still others may have arrived in the past and failed to establish themselves. The conclusion, then, is that most dragonfly populations are constantly changing. While some species become extinct, wind-borne dragonflies are continually arriving, some establishing themselves more or less permanently and others finding the environment unsuitable. The wind, therefore, is one of the most influential factors affecting dragonfly populations.

2. Since the two ponds are of quite different character, it is logical that each should have its characteristic dragonflies. The *Anaces, Celithemi,* and *Tramea* flew in great numbers about all parts of the clear pond, while *Argia* and most of the *Enallagmae,* except for *pictum,* were found commonly at the cedar pond and often not elsewhere. Many of the other species occur at both ponds but in sharply differing degrees of abundance. Here it is possible that the pond containing decidedly smaller numbers of such a species has simply received the overflow or the wanderers from the other pond. Still other species occur chiefly in the flooded grassy area between the ponds and one of these, *L. semifasciata,* has not been seen elsewhere. In every case, the number of individuals of all species combined, occurring at a given point in either pond, varied inversely as the distance of that point from the other pond. In a shallow, weedy bay of the clear pond, the nearest point to the cedar pond, and in the flooded area between the ponds, the dragonfly population reached its greatest development, both in numbers and species. Here, too, occurred all of the species which were not generally distributed about either pond. These facts demonstrate the rule that in habitats where a variety of environmental features exist, the largest number of species and individuals occur where the greatest number of these features appear close together or in combination.

3. At the Upton ponds, a combination of conditions exists which is particularly favorable to the existence of several species of dragonflies which have not been found elsewhere in New Jersey in such great numbers. For example: during the summer of 1930, before these ponds existed, B. E. Montgomery collected extensively in southern New Jersey, but found only one individual of *Celithemis martha.* At the ponds, it was so abundant that the number of specimens collected, thirty-three, conveys no idea of how many were seen. Specialized collecting could have procured a hundred or more on many days. In the literature, there is no record of *Anax longipes* being seen or collected in very large numbers in the United States. On a single day at Upton, at least twenty different individuals of *longipes* have been seen. This is a conservative figure. From this evidence it is logical to conclude that the environment offered by the ponds at Upton is unusually favorable to dragonflies. That many additional species will be found there is not unreasonable to expect.

4. Southern New Jersey, below the fall line, has long been recognized as the meeting place of northern and southern animals and

plants. Though the flora seems predominantly southern, many plants of the Transition and Canadian Life Zones persist as far south as Cape May, which is considered the northernmost outpost of the Lower Carolinian Life Zone. Only in such a region as this could *Celithemis ornata* and *Leucorrhinia frigida* be found side by side, or *Dorocordulia lepida* of the north be found flying with the southern *Libellula deplanata.* Only the unusual character of the region can explain this odd juxtaposition of northern and southern species.

5. Though it is the usual habit of dragonflies to quit their aquatic habitat as soon as they are able to fly, and seek the protection of wooded areas until their chitinization is complete, *Sympetrum vicinum* remains close to the ponds during its teneral life and then flies to the adjoining woods when mature. This habit has been noted elsewhere for this and other *Sympetra,* and it is doubtless displayed by certain other dragonflies.

6. Time of day has an important influence upon the emergence of dragonflies. Between seven and ten o'clock in the morning, various species, including *Celithemis elisa* and *martha* (♀), *Pachydiplax longipennis, Enallagma pictum,* and *Anomalagrion hastatum,* were found emerging, often in great numbers. By noon, most of the tenerals had disappeared from the banks of the ponds and the only trace of the mass emergence is the dead and dying dragonflies at the water's edge which encountered obstacles to their ecdyses. Most of the teneral Zygoptera do not stray far from the water, but conceal themselves as well as they can in the vegetation of the banks. These are often stirred up by the collector soon after emergence, but they are not normally on the wing as tenerals, in marked contrast to most of the Anisoptera.

7. The flight of mature dragonflies also is influenced greatly by the hour of the day as well as the familiar factors of temperature, sunshine, and amount of wind. Many species were found to be most active and abundant in the forenoon, while others appeared in largest numbers later in the day and often remained on the wing until evening. The first category includes *Anax longipes,* the *Celithemi,* most of the *Libellulae,* and *Tramea carolina.* The second group is composed chiefly of the Zygoptera. In the case of some species, especially *Celithemis elisa* and *martha,* many single males were noted quite early in the morning, but ovipositing pairs were not seen until several hours later. This indicates that in some cases the males are on the wing earlier than the females, or that the females show no predisposition to copulate at so early an hour.

The teneral females seen early in the day do not enter into this question since every female which has yet been taken in coitu was thoroughly mature. As a general rule, copulation and oviposition takes place largely during the midday hours.

8. The sex of dragonflies is more or less connected with their seasonal distribution. For instance, periods of great abundance of *Anomalagrion hastatum* have been noted for each sex, but these periods fail to coincide. In the case of *Celithemis martha,* teneral females have been seen in almost equal numbers throughout the season, while no teneral males have been seen. This indicates either that the general emergence-period of the males was very early in the season or that the males and females both emerge throughout the season and the teneral males manage to conceal themselves better than the females. The facts point to the first conclusion since the average run of males captured has been older and older as the season progressed, while the average females throughout the season have been teneral or juvenile. The fact that occasional old females have been taken far away from the ponds suggests that they may migrate from the ponds along with the males which commonly do so.

In the foregoing pages no mention has been made of one of the most important factors in the ecology of insects: food. This subject is being studied separately and will be reported upon at a later date.

THE STRATIOMYIDAE OF NEW JERSEY.[1]

By Janet L. C. Rapp, University of Illinois,
Urbana, Ill.

The Stratiomyidae, small to rather large bristleless flies, bare or only slightly pubescent, are commonly called "Soldier Flies" because of their conspicuous bands or strips of white, yellow, or green. They occur on flowers or other herbage, especially on long grass near water. Some of the distinguishing characteristics include the annulate third antennal segment usually having an arista, the crowding and strenghtening of the wing veins near the costa, and the conspicuous development of the thorax.

There are no satisfactory keys covering the entire family. Dr. C. H. Curran, however, has published a synopsis of the Canadian species.[2]

I have examined material in the American Museum of Natural History (A) and the Academy of Natural Sciences in Philadelphia (P). The private collection of J. L. C. and W. F. Rapp (R) contains only two specimens of Stratiomyidae. Records have also been taken from J. B. Smith's "Insects of New Jersey," 1909 (S). Although this catalogue contains the same number of genera and only four more species than that of Smith, it includes 46 additional localities.

ADOXOMYIA Kertesz.

A. subulata (Loew)
Clitellaria subulata Loew, Cent., VI, 29. Hunterdon Co. VI–21–1918 (A); Riverton VIII–8 (S).

ALLOGNOSTA Osten Sacken.

A. fuscitarsis (Say)
Beris fuscitarsis Say, Acad. Sci. Phil., III, 29. Anglesea V–27, Caldwell, New Brunswick, Newark VI–15, Trenton V–21 (S).

A. obscuriventris (Loew)
Metoponia obscuriventris Loew, Cent., IV, 45. Anglesea V–30, Culver's Lake V–29, Ocean Co. V–30, Westville VI–15 (S).

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[1] Contribution to a New Catalogue of New Jersey Diptera, II.

[2] Curran, C. H. 1927. Trans. Roy. Soc. Can., Sec. V, pp. 191–228.

ACTINA Meigen.

A. viridis Say

Long's Exped., App., 368. Ashland V–30, Clementon V–30, New Brunswick, Ocean Co. (S).

EUPARYPHUS Gerstaecker.

E. tetraspilus Loew

Cent., VII, 15. Boonton VI–14 (S).

HERMETIA Latreille.

H. illucens (Linn.)

Musca illucens and *leucopa* Linn., Syst. Naturae, 12th ed., II, 979. Trenton VII–7 (S).

GEOSARGUS Bezzi.

G. caeruleifrons (Johnson)

Sargus caeruleifrons Johnson, Ent. News XI, 325. Dunnfield VII–12, Riverton VI–15 (S).

G. cuprarius (Linn.)

Musca cuprarius Linn., Fauna Suecica, 1853. Arlington VIII–20–1918, Caldwell VIII–13–1917, Irvington VII–2–1918, Newark VI–14–1912, Orange Mts. VI, Rutherford VIII–16–1918 (A).

G. elegans (Loew)

Sargus elegans Loew, Cent., VII, 10. Caldwell (S); Forest Hill VIII, New Brunswick VIII–15–1918, Ramsey VI–23–1935 (A).

G. decorus Say

Long's Exped., App., 376. Forest Hill IX, New Brunswick IX–15, Newark V, Ramsey, V–30–1931 (A); Trenton V–26 (P); Caldwell, Cape May VI–17–1915, Jamesburg VIII–4, Merchantville V–26, Newark VI–14, Riverton VI–15, Trenton V–26 (S).

G. viridis Say

Jour. Acad. Sci. Phil., III, 87. Clementon V–30 (S); Trenton V–21 (P & S).

MACROSARGUS Bigot.

M. clavis Will.

Can. Ent., XVII, 123. Hunterdon Co. VI–15–1918, New Brunswick, VI–15–1918 (A); Newark VI (S).

MICROCHRYSA Loew.

M. polita (Linn.)

Musca polita Linn. Fauna Suecica, 1854. Merchantville VIII–19, New Brunswick, Newark V (S).

NEMOTELUS Geoffroy.

N. carbonarius Loew

Cent., VIII, 6. Anglesea VII–4, Avalon VI–8, Cape May VI–14 (S).

N. crassus Loew

Cent., III, 10. Lenola V–30 (S).

N. melanderi Banks

Canad. Ent., LII, 65. Morgan VI–5–19, VII–19–30, VIII–7 (A).

N. unicolor Loew

Cent., III, 11. Manahawkin IX–5–10 (A).

ODONTOMYIA Meigen.

O. cincta Olivier

Encycl. Méthodique, VIII, 432. Anglesea V–14 (S); Arlington VI–4 (A); Avalon VI–9, Cape May VI–14, Palisades VI–7 (S); Ramsey VI–12–1912 (A).

O. flavicornia Olivier

Encycl. Méthodique, VIII, 433. Caldwell, Southern N. J. (S).

O. hieroglyphica Olivier

Encycl. Méthodique, VIII, 434. Morris Plains VI–25 (S).

O. hydroleonoides Johns.

Trans. Amer. Ent. Soc., XXII, 261, N. J. (A).

O. interrupta Olivier

Encycl. Méthodique, VIII, 433. Brown's Mills V–17–1921, Hemlock Falls V, Morgan V–25, Orange VI–5–1932, Overbrook VIII–30–1907, Ramsey V–30–1917 (all A); Ashland V–13, Clemonton V–10, Sandy Hook, Westville IV–26 (all S); Clemonton, Medford V–13–05, Pemberton V–10–08 (P).

O. microstoma Loew

Cent., VI, 28. Anglesea VII–25, Avalon VIII–2–92, Cape May VI–22, Sea Isle City VII–14–18, Wildwood VII–20 (all P); Atlantic City VII–15 (S).

O. profuscata Steyskal

Occ. Pap. Mus. Zool. Univ. Mich., Ann Arbor, no. 386, 1938, 3, 4. Rutherford (A).

O. pubescens Day

Proc. Acad. Nat. Sci. Phil., 77, 1882. Sandy Hook (S).

O. vertebrata Say
Long's Exped., App., 369. Anglesea V–30, VII–19 (S & P), Ashland VII–16, Avalon VI–30 (S); Snake Hill VII–16 (A); Westville VI–14 (S).

O. virgo (Wiedemann)
Stratiomys virgo Wiedemann, Auss. Zw., II, 69. Arlington VII–12, Burlington Co. VI–27–1918, Montclair VII–15–1900, Mt. View VII, Rutherford (A); Clementon VI–25, Merchantville VI–28, Trenton VII–7, Westville VIII–12 (S).

OXYCERA Meigen.

O. maculata Olivier
Encycl. Méthodique, VIII, 600. Clementon V–30 (P); Egg Harbor VII–10, Lenola, Merchantville VI–28 (S).

PACHYGASTER Meigen.

P. pulcher Loew
Cent., III, 16. Avalon VII–22 (S).

PTECTICUS Loew.

P. trivittatus Say
Jour. Acad. Sci. Phil., VI, 159. Bloomfield VII (A); Dunnfield VII–8 (S); Hemlock Falls VII, New Brunswick VII–18–1918 (A); New Brunswick VII–29–1943, IX–11–1943 (R); Ramsey VIII–20–1942, VII–5,18–1935 (A); Riverton VI–20, VII–3, Westville VIII–8.

P. sackeni Will.
Can. Ent., XVIII, 124. Brown's Mills VIII–30, Dunnfield VII–15, New Brunswick VIII–21, Riverton VII–16, Westville VII–2 (S).

STRATIOMYIA Geoffroy.

S. discalis Loew
Cent., VI, 14. Ashland VI–21, Clementon V–16, Cramer Hill V–23, Elizabeth V–17, Westville VI–15 (S).

S. norma Wied.
Auss. Zw., 62. Caldwell, Delaware Water Gap VII–15 (S).

S. meigenii Wied.
Auss. Zw., II, 61. Anglesea VII–19 (S); Cape May VII–2–1933 (P); Westville VII–5, VIII–8 (S).

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Vol. XLI February, 1946 No. 1

A NEW WEST INDIAN SCARAB BEETLE.

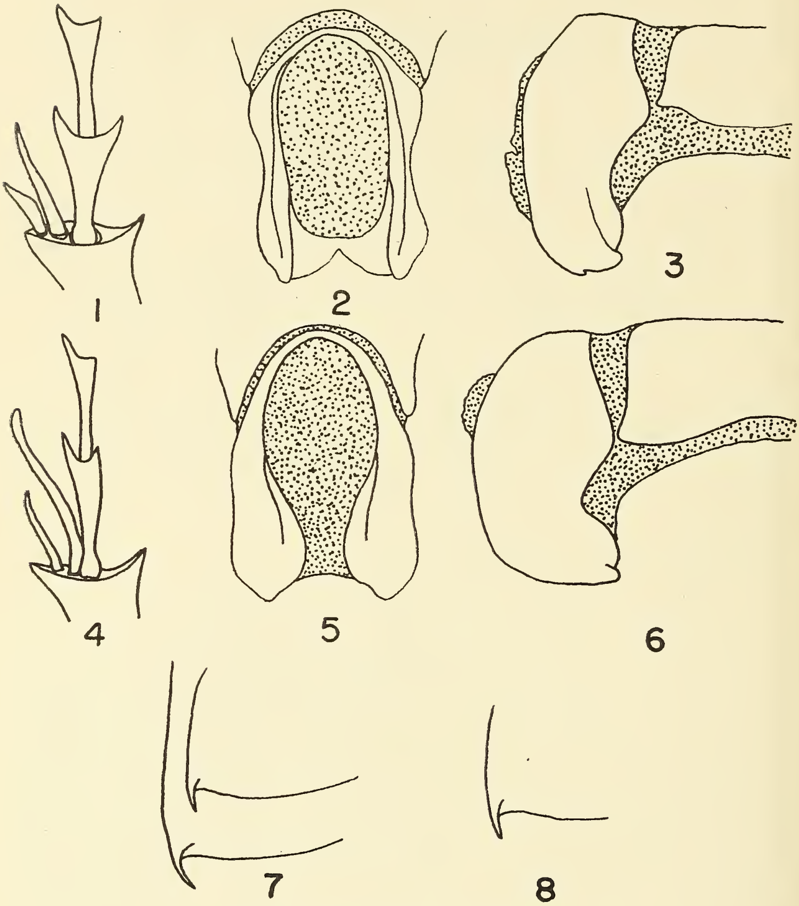
By Lawrence W. Saylor, San Francisco, Calif.

The present new species has been awaiting description in the Saylor Collection for some years; it closely resembles an important rather common species from the same locality—Haiti and Santo Domingo.

Cnemarachis romana, new species.

Male: Elongate, somewhat broader behind. Color variable; usually piceous or rufopiceous, with the entire dorsal surface pruinose or subpruinose, especially the elytra; rarely, the color is rufous to rufocastaneous, these specimens possibly representing newly-matured individuals. Apparently glabrous above. Head with the front slightly rugose and moderately densely covered with umbilicate, and a few variolate punctures. Clypeus moderately long, apex faintly and broadly emarginate, the angles very broadly rounded, margin slightly reflexed; disc moderately densely punctate, the punctures closer at center base. Antenna of 9 segments, club ovate and subequal to funicle in length; segments 5 and 6 strongly transverse. Thorax with punctures on disc separated by one to three times their diameters, but closer at and near the front angles; center disc at times with a very faint suggestion of a longitudinal carina; apex with an entire but narrow margin, base with a fine margin only at sides and becoming obsolete just before the middle; sides nearly parallel behind the median dilation, and the margins entire or at times subcrenulate in the apical halves; front angles varying from rectangular to acute, hind angles well marked but obtuse. Elytra rugose, with moderately dense and fine punctures; disc substriate but due to rugosity of surface the exact number of striae are not plain; inner sutural apex with a short outwardly-curving spine on each elytron;

MAR 22 '46



EXPLANATION OF PLATE.

Fig. 1. Apex hind tibia, *C. hogardi.*
Fig. 2. En-face view male genitalia, *C. hogardi.*
Fig. 3. Lateral view, *idem.*
Fig. 4. Apex hind tibia, *C. romana.*
Fig. 5. En-face view male genitalia, *C. romana.*
Fig. 6. Lateral view, *idem.*
Fig. 7. Two views elytral apex of *C. hogardi.*
Fig. 8. Apex elytra of *C. romana.*

sutural stria varying from the same width throughout and becoming obsolete apically, or, strongly narrowed at base (Type) and becoming broader along most of the sutural margin, and obsolete apically. Abdomen and pygidium yellowish and highly polished. Pygidium flattened, subglabrous, with moderately coarse and sparse (varying to moderately dense) punctures; apex subtruncate. Abdomen semiflattened, 5th sternite transversely depressed in apical half, the disc with sparse, very fine and nearly pin-point tubercles; 6th sternite three-fourths length of 5th, apex and base semicarinate, disc broadly and transversely flattened, and finely rugose or finely punctate. Metasternum with very fine semierect hair. First two hind tarsal segments subequal. Longest spur of hind tibia strongly curved and much longer than the first tarsal segment. First two front tarsal segments each with a fine short tooth at the inner apex. All tarsal claws each with a strong and median tooth which is much broader than the apical tooth; claw base rectangularly dilated.

? *Female:* More robust than male, nearly piceous and shining. Clypeus broader, and front and clypeus extremely densely punctate. Thorax with very coarse and moderately dense punctures, with a small, median impunctate area at center-base. Pygidium and abdomen rufocastaneous. Pygidium with very fine and dense punctures and with sparse short hair. Abdomen polished, 5th sternite flattened, 6th sternite slightly convex and with fine and dense punctures. Hind tibial spurs short, stubby and spatulate, the longest a little longer than the first tarsal segment. Antennal club ovate and equal to segments 3 to 6 combined in length. Otherwise as in male. Length 17–19 mm. Width 8.5–9.5 mm.

The *holotype* male is in the U. S. National Museum and is from "Moca, Dominican Republic," collected April 1928 by G. Russo. A female from the same locality and date is not designated as the allotype since I am not absolutely positive that it is the female of this species. Three males and one female in the Saylor Collection, collected in "Dominican Republic, La Romana, July" remain in that collection. *C. romana* is very closely related to the common *C. hogardi* (Bl.) but differs mainly in the type of hind spurs, the shape of hind tarsal segment, and the male genital characters.

PRELIMINARY LIST OF SPIDERS OF THE GREAT SWAMP[1]

By Janet L. C. Rapp and William F. Rapp, Jr., Urbana, Ill.

In January 1944 the authors began an ecological survey of a portion of the Great Swamp, Chatham Township, Morris County, New Jersey. The survey is being conducted on an area one-half mile square. This area is easily located as it is bounded on the north by Southern Boulevard as far as one-half mile west from the point where the Public Service High Power Line crosses it and on the east by the power line to a distance one-half mile south from Southern Boulevard.

The following list of spiders was taken by sweeping in the terrestrial grass lands on the southern face of the Wisconsin Terminal Moraine which forms the northern boundary of the Great Swamp. We are greatly indebted to Dr. Willis J. Gertsch of the American Museum of Natural History for identifying the specimens. All specimens were collected by the authors.

Steatoda borealis (Hentz), 1 male, April 22, 1944.
Pityophyphantes costatus (Hentz), 1 female, April 22, 1944.
Singa pratensis Emerton, 1 immature female, April 22, 1944; 5 immature females, August 13, 1944.
Frontinella communis (Hentz), 1 female, April 22, 1944.
Coras medicinalis (Hentz), 1 male, April 22, 1944.
Tegenaria derhami (Scopoli), 1 immature female, April 22, 1944.
Neoscona sp., 1 immature female, July 9, 1944.
Oxyopes salticus Hentz., 1 female, July 9, 1944; 1 female, August 13, 1944.
Zygoballus bettini Peckham, 1 female, July 9, 1944.
Hyctia pikei Peckham, 1 immature female and 1 male, July 9, 1944; 1 male, August 13, 1944.
Metaphidippus capitatus (Hentz), 1 female, July 9, 1944.
Maevia vittata (Hentz), 1 immature female, July 9, 1944; 2 immature, August 13, 1944.
Evarcha hoyi, Peckham, 1 female, July 9, 1944; immature male, August 13, 1944.
Misumenoides aleatorius (Hentz), 1 male, August 13, 1944.
Misumenops asperatus (Hentz), 1 immature, August 13, 1944.
Thanatus lycosoides Emerton, 1 immature, August 13, 1944.
Dictyna sp., 1 immature female, August 13, 1944.
Mangora gibberosa Hentz, 1 immature female, August 13, 1944.

---

[1] First contribution to the Great Swamp Ecological Survey.

Argiope trifasciata (Forskal), 3 immature males, August 13, 1944.
Phidippus sp., 8 immature, April 13, 1944.
Habronattus sp., 1 immature female, August 13, 1944.

Pseudoepameibaphis Aphid Records.—Most species in this small but interesting genus are rather flattened pear-shaped, in general body form. These aphids usually were collected on *Artemisia tridentata* or its varieties. Populations at times were high enough to cause injury to this important range browse plant.

Pseudoepameibaphis essigi K.–S. was collected at Wells, August 20, 1943, Battle Mt., August 16, 1945, and Carlin, July 24, 1944, in Nevada. It also was taken at Mt. Nebo, Utah, July 12, 1942; Hamilton, Montana, August 7, 1944 (Knowlton), and Kleine, Montana, June 19, 1942 (H. F. Thornley); and at Ephrata, Washington, August 14, 1945.

P. tridentatae (Wilson) was found in the stomach of a rock wren collected at Dolomite, Utah, September 28, 1941; at Emigrant Pass, Nevada, July 12, 1944 (6100 feet elevation); Snowwater Lake, Nevada, August 20, 1943; Yellowstone Park, Wyoming, August 2, 1944; Clyde Park, Montana, June 25, 1942 (H. F. Thornley).

P. glauca G.–P. at Hiawatha, September 6, 1945, Mt. Nebo, July 12, Brigham Canyon and Mantua, August 29, 1936, in Utah; Emigrant Pass, Nevada, July 24, 1944; Wells and Snowwater Lake, Nevada, August 20, 1943; Flagstaff, Arizona, September 23, 1944; Forsyth, June 1, Custer, June 2, Roundup, June 5, Ryegate, May 14, and Rothiemay, June 19, in Montana during 1942 (H. F. Thornley).—G. F. KNOWLTON, Utah State Agricultural College, Logan.

Badly Wanted by the Editor.—Brief notes from 4 to 30 typed lines to fill such blanks as this and others in this number and other numbers.

THE ENCYCLOPEDIAS AGAIN!

By Phil Rau, Kirkwood, Missouri.

Both Mr. Torre-Bueno and I have become pretty well heated under the collar when we found that our pet entomologists had been so badly treated by the encyclopedias (Bull. Brook. Ent. Soc. 39: 119–121, 1944), but I have recently discovered that editors of encyclopedias have their troubles too, and some of these troubles are with biologists and entomologists to whom they turn for contributions. To know the story of their tribulations, one needs to read the delightful essay by Frank Moore Colby, entitled "The Trials of an Encyclopedist."*

Mr. Colby, who has been associated with encyclopedias in one capacity or another for many years, candidly admits that there is hardly a page of any encyclopedia, even the best, that does not include matters of less significance than something which has been left out. And while he does not tell us why certain important names have been omitted (including, of course, those of entomologists!), he does tell us why certain names of no importance, as Mr. Torre-Bueno criticizes, persist to be included.

"In the department of biography," says Colby, "names of men and women are preserved merely as the result of the whim of some hack writer long since dead. If the late Leslie Stephen, in his much respected 'Dictionary of National Biography' had in a sportive mood written three pages apiece on six purely imaginative British worthies—invented their names, dates, the books they wrote, the offices they held, their birth places and their burial places—you would no doubt find them in condensed form in the new edition of the *Britannica.* Posterity would be sure to encounter some of them."

Colby waxes satirical when he speaks of the specialists in zoology, at whose hands he evidently has fared rather badly when he sought their help. He thinks if he could find the Huxley type, all would be easy. Huxley called himself the Reverend Father of Worms and the Bishop of Annelida, but his mind would often wander far from his specialty. "Nowadays, the man of worms is homesick when away from them. He is, moreover, disdainful of all elements that are accessible to the layman. He calls it popularizing to mention them."

Colby distressedly says an editor of an encyclopedia cannot have a sub-editor for every animal, but that is what the zoologist expects. He remembers how Dr. Holmes' naturalist flew into a rage when someone called him a Coleopterist—he was a Scarabist. "Nowadays a zoologist seeks out his animal in early life and henceforth stays with it. Often the intimacy between them is so great that it seems indelicate to intrude."

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* Reprinted in Clifton Fadiman's anthology, "Reading I've Liked," pp. 275–286, 1941.

Colby gets especially severe with entomologists and zoologists who, he thinks, take themselves much too seriously. When he tried to organize a department of biology, he found no one who would take charge of any branch of the subject. "No man would leave his insect for that foolish, scattering, popular subject, entomology." He went to Washington, "where biologists were very thick and tame." He put himself up at a certain learned club which seemed "a sort of runway for biologists, where the layman might watch them as they came to drink." But when he came to meet them, it was no easier. "It was impossible to get the mosquito man away from his mosquito, the fossil horse man would not dismount, and the fish people, though kind, were firmly fishy." Day after day, he passed from one biologist to another. He finally left Washington, and had recourse to correspondence—wrote many letters full of Oriental flattery—"abject grovelling in a style I had learned as a layman addressing specialists."

Finally he got a man to take charge of the department, who carried the work half through then forgot it and sailed for Europe, "chasing some insect, I suppose." In the absence of this man, he fell into the hands of a group of zoologists "whose eccentricities were scandalous" and part of the work had to be done over twice, and part of it three times.

This then is a picture of zoological biologists seen through the eyes of an encyclopedist and portrayed in the Year of Our Lord Nineteen Hundred Eleven.

Date of Mailing of Bulletin of the Brooklyn Entomological Society for October, 1945, vol. XL, no. 4.

The actual date of mailing of this number is February 9, 1946. Authors of new species and bibliographers please note.

A NEW MESOVELIID FROM ECUADOR (HEMIPTERA, MESOVELIDAE).

By C. J. Drake and H. M. Harris, Ames, Iowa.

The present paper contains the description of a new water strider of the genus *Mesovelia* Mul. & Rey and a check list of the genera and species of the family Mesoveliidae of the Western Hemisphere. The type of the new species is in the collection of the authors.

Mesovelia hambletoni n. sp.

Winged male: Form, size and color very similar to *M. mulsanti* M. & R. but without the tufts of dark-fuscous, bristle-like spines on first genital segment. Pale testaceous, the hind lobe of pronotum darker and with a median, testaceous line. Rostrum long, extending to hind coxae, testaceous, the last segment mostly dark fuscous. Antennae long, slender, yellowish brown to brown; segment I long, slightly bowed, becoming slightly thicker apically, with a long bristle-like hair at apical third, subequal in length to width of head through eyes; II slender and distinctly shorter (30: 23); III and IV very long and very slender.

Pronotum broader than long (42: 34); front lobe yellowish brown, about one-third of the total length of pronotum; with short, impressed, oblique line on each side, hind lobe varying from brown to very dark brown, the median, testaceous line variable in size, the humeri prominent. Scutellum with a testaceous spot. Hemelytra extending beyond apex of abdomen, smoky brown, with prominent, dark-fuscous nervures, the membrane light brown; hind wings a little longer than abdomen, white. Legs long, slender, testaceous, the last tarsal segment fuscous; intermediate femora with a row of dark-fuscous, bristly hairs within; fore femora with shorter, less conspicuous bristles. Abdomen beneath testaceous, moderately hairy; genital segments distinctly hairy, particularly on the sides, the first segment impressed beneath. Female and aperous forms unknown.

Length, 3.30 mm.; width, 0.80 mm.

Type (male) and 1 male *paratype,* Pichilingue, Ecuador, Oct. 1944. Named in honor of the collector Edson J. Hambleton, who has taken an active interest in South American insects. The absence of the two tufts of dark bristly hairs on the first genital segment easily separates this species from other American members of the genus. The sides of the genital segments are clothed with numerous, long, pale hairs as in *mulsanti.*

FAMILY MESOVELIIDAE.

Genus *Mesovelia* Mulsant and Rey, 1852.
Fieberia Jakowleff, 1874.
Haplotype, *furcata* Mul. & Rey, 1852.

1. *amoena* Uhler, 1894 West Indies, Braz., Pan., U.S.(Tex., La.)
2. *bila* Jaczewski, 1928 Brazil, Arg.
3. *crytophila* Hungerford, 1924 U.S. (Mich., Ia.)
4. *douglasensis* Hungerford, 1924 U.S. (Mich.)
   (? = amoena Uhler)
5. *hambletoni* Drake & Harris, 1945 Ecuador
6. *mulsanti* White, 1879 Western Hemisphere
   var. *mulsanti* White, 1879
   var. *bisignata* Uhler, 1884
   var. *meridionalis* Jaczewski, 1930
   var. *caraiba* Jaczewski, 1930
7. *zeteki* Harris & Drake, 1929 Panama, Brazil.

Genus *Mesoveloidea* Hungerford, 1929.
Haplotype, *williamsi* Hungerford, 1929.

1. *williamsi* Hungerford, 1929 Ecua., Peru, Costa Rica, Guat., Trinidad, B.W.I.

NOTES ON THE BEHAVIOR OF A FEW SOLITARY WASPS.

By Phil Rau, Kirkwood, Missouri.

Ancistrocerus spinolae de Sauss. [Jos. Bequaert]. A wasp of this species was taken on the windowpane of my study on May 9, 1939. It evidently escaped from one of the bags containing nests of *Sceliphron caementarium* collected in St. Louis County, Missouri.

Ancistrocerus unifasciatus de Sauss. [G. A. Sandhouse]. Several individuals emerged, May 13 to 20, 1933, from mud-nests of *Sceliphron caementarium* collected at Grubville, Missouri. Many adults of this species were seen feeding on the small flowers of the buck brush, *Symphoricarpos orbiculatus* Moench [E. S. Anderson] at Ranken, Missouri. On July 27, 1930 several dipterous parasites, *Pachyophthalmus floridensis* Tns [J. M. Aldrich] emerged from their cells.

Pemphredon (*Cemonus*) *tenax* Fox [G. A. Sandhouse]. A colony of these wasps lived in tunnels of a dried stump under a clubhouse porch at Dieke, Missouri. The stump was brought into the laboratory on August 14, 1938, and during the following week nine wasps emerged. The tunnels were evidently those which were made by beetles. Each mother used burrows independently, and not in a social or semisocial way.

Tachysphex terminatus F. Sm. [G. A. Sandhouse]. Many females were seen digging burrows in the loose soil under a clubhouse at Dieke, St. Louis County, Missouri, August 14, 1938. They fill the nests with small nymphs of an Acridid, some of which are *Melanoplus* sp. [A. B. Gurney]. Prey taken from incoming wasps at Kirkwood, June 26, 1932, were nymphs of *Arphia sulphurea* Fab. [A. N. Caudell], and *Dichromopha viridis* Scud [A. N. Caudell].

Tachytes elongatus Cress [G. A. Sandhouse]. A locust was taken from a wasp as she was carrying it into a burrow at Reelsfoot Lake, Tennessee, July 13, 1937. It proved to be *Melanoplus differentialis* Thos. [A. B. Gurney].

Sceliphron caementarium Drury. From a cocoon of this wasp taken at Ranken, Missouri, I bred, on June 28, 1932, the dipterous parasite *Spogostylum obsoletum* Loew [C. T. Greene] and on July 29–30, 1926, I bred from cocoons of this wasp eleven dipterous insects, *Pachyopthalmus floridensis* Tns. [C. T. Greene].

There is to my knowledge no record of the mating behavior of this wasp. I have, however, observed courtship behavior that probably culminated in mating. I watched a female wasp on June

26, 1932, as she came to the mud puddle; as she was preparing for flight, a male resting upon a stone nearby, flew swiftly into the air and pursued her. They were both soon beyond my range of vision, but after a little while he returned and resumed his position on the rock. In the same way he pursued the next female that came to the water, and the next one and also the next one, always returning to his place on the rock. Finally when he returned no more, I assumed he had been successful in his quest and mating had taken place in the air. He must have watched the female very closely as she came to the water's edge, for while he would not molest her while at work, he would always fly into the air at the same time she did, and trailing close behind her would sometimes hit her body with his own.

Cryptocheilus unifasciatus Say [G. A. Sandhouse]. Several individuals were observed feeding on flowers of *Eupatorium* sp. at Pacific, Missouri, Sept. 4, 1938.

Microbembix monodonta Say. A wasp of this species was seen to enter a burrow in the sand at Silica, Missouri, July 18, 1922. She was carrying a beetle, *Discoderus parallelus* [E. A. Schwarz] which appeared to be dead.

Scolia bicincta. Many were seen feeding on the flowers of the buck brush, *Symphoricarpos orbiculatus* Moench [E. S. Anderson].

Scolia nobilitata Fab. [G. A. Sandhouse]. One specimen was observed feeding on flowers of *Erigeron canadensis* August 7, 1932.

Stizoides unicinctus Say [G. A. Sandhouse]. Several specimens were feeding on flowers of *Pycnanthemum flexuosum* (Walt) B.S.P. [E. S. Anderson] at Kirkwood, Missouri, July 18, 1937.

Myzine quinquecincta Fab. [G. A. Sandhouse]. Several individuals were in company with *Stizoides unicinctus* feeding on same flowers.

Chrysis (*Trichrysis*) *parvula* Fab. [G. A. Sandhouse]. A male and female of this species were taken at clay bank at Kirkwood, Missouri, on July 4, 1930. This bank contained many nests of several species of mining-bees and mining-wasps. Another specimen was taken on the windowpane of an old house at Lesterville, Missouri, July 25, 1938.

Chrysis (*Tetrachrysis*) *coerulans* Fabr. [G. A. Sandhouse]. Two specimens were taken on July 26, 1932, at the above-mentioned clay bank.

Chrysis (*Hexachrysis*) *fabricii* Mocsary [G. A. Sandhouse]. Four specimens were taken at the clay bank mentioned above on June 23, 1932.

A NEW SPECIES OF PODABRUS.

(Coleoptera—Cantharidae).

K. M. Fender, McMinnville, Ore.

Podabrus frosti n. sp.

Head black, sides in front pale beneath the antennae; antennae black with each segment pale basally; pronotum pale with a large hexagonal median brunneous spot; elytra piceous with the side margins and suture narrowly pale; coxae, basal half of femora and knees of all legs pale, rest of legs dark reddish brown; underside of thorax, last two ventral segments and apical half of fifth ventral segment of abdomen yellowish, the rest of underside reddish brown.

Head as wide as, or slightly wider than, the pronotum in the male, not quite as wide as the pronotum in the female; clypeus smooth, front sparsely, occiput and neck densely punctate, surface shining. Antennae rather stout, a little longer than one half the length of the body; segments two and three of equal length. Pronotum three fourths wider than long; sides arcuately narrowed in front, feebly narrowed and slightly sinuate before the hind angles which are feebly prominent; surface shining, the convexities and the area in front of them moderately punctured, the sides very finely punctate; a short eroded line between the convexities. Elytra rugose, more roughly so apically; discal costae nearly obliterated. Protibiae of male curved basally and with an angular dilation on the inner side at about the apical third. Hind coxae of male an apical process. All claws of both sexes armed with long acute teeth so that they appear to be broadly cleft. Length 9 to 10.5 mm.

Holotype, male and allotype, female, Natick, Mass., May 30, 1936. Paratypes; (1) Sherborne, Mass., May 30, 1935, (1) Sherborne, Mass., June 11, 1916, (1) Framingham, Mass., May 29, 1931, (1) Framingham, Mass., May 30, 1934. These were all collected by Mr. C. A. Frost.

This species is nearest *Podabrus knobeli* Fall and *P. frater* Lec. The elytra of *P. frater* are totally black. In *P. knobeli* the body beneath, the legs and the antennae are all black and the second antennal segment is notably shorter than the third. I take great pleasure in naming this species in honor of the collector.

VERNACULAR VERSUS LATIN NAMES IN THE BEES.

(Hymenoptera: Sphecoidea).

By V. S. L. Pate, Ithaca, New York.

The late Miss Sandhouse in her invaluable catalogue of the generic and subgeneric names of the bees[1] gives *Lithurge* as the correct orthography for the genus customarily known as *Lithurgus.* Dr. C. D. Michener in his excellent treatise on the classification of the bees[2] also uses the spelling *Lithurge.* However, anyone familiar with the work of Latreille knows he was greatly addicted to the use of vernacular names. And according to Opinion 48 of the International Commission on Zoological Nomenclature, vernacular names are to be considered *nomina nuda:* they are not entitled to citation from the dates in question.

In his 1825 work *Familles naturelles du Règne Animal,* Latreille, in almost all cases, employed a vernacular name for the genera. This work consequently has little or no nomenclatorial status. Thus the generic names *Lithurge, Ancyloscèle, Melissode, Oedipode* and *Podisme,* proposed by Latreille in 1825 in this publication, have no nomenclatorial status until they appear in the proper Latin form. In 1827 Berthold published a German edition of Latreille's work under the title *Natürliche Familien des Thierreichs aus dem Fransösichen mit Ummerkungen und Zusätzen:* this translation into German is very close to the French original except that Latreille's vernacular names *Lithurge, Melissode, Ancyloscèle, Oedipode, Podisme* and so on were latinized as *Lithurgus, Melissodes, Ancyloscelis, Oedipus* and *Podisma.* And under our present system of nomenclature, it is Berthold's latinized forms of Latreille's vernacular names which must be used, always provided of course that they are not, like *Melissodes, Melitoma, Ancyloscelis* and others, still *nomina nuda* as of that date.

In a few cases like the Psammocharid genus *Planiceps,* the vernacular name of Latreille coincides with the Latinized version of Berthold and Lepeletier and Serville. In such instances, I believe the names may be considered valid as of 1825 and accredited to Latreille.

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[1] Proc. U. S. Nat. Mus., XCII, pp. 519–619, (1943).

[2] Bull. Amer. Mus. Nat. Hist., LXXXII, pp. 151–326, (1944).

SOME AUTUMN VISITORS.

By W. Prescott Rogers, Fall River, Mass.

During September and early October on the southern seacoast of Massachusetts autumn collecting of Lepidoptera is interesting and frequently profitable. The appearance of species usually associated with more southerly regions will reward collectors who wish to prolong the season. A few species taken in recent years may interest collectors elsewhere.

H. phylaeus Drury.—A fresh male specimen taken October 5, 1943, on short-stemmed asters in a hay field at Westport Harbor, Mass. It may be assumed the specimen was reared in this region as its prime condition indicates the insect could not have been on the wing forty-eight hours.

P. protodice Bois.-LeC. is occasionally found at fall asters and goldenrod in fields near the seashore. A female was taken September 9, 1940, at Westport Harbor. A male was taken at Fall River on the Taunton River shore on October 4, 1943.

C. eubule Linn. is such a powerful flyer that captures have not been frequent. Many have been seen in flight. Three males were taken at Westport Harbor September 18, 1937, August 25, 1938, and September 19, 1943—all in excellent condition. It seems reasonable to assume they were reared in this region. No females have been taken but several in flight have been observed.

The autumn season of 1945 was an extremely favorable time for the appearance of several species in large numbers. *E. lisa* Bois.-LeC. could be found along the southern Massachusetts shore on any day of fair weather. They were so numerous it was easy to identify them from a motor car in motion. *J. coenia* Hübn. was equally abundant in colonies. As many as one hundred specimens were visible at one time. On the southern shore of Cockeast Pond, Westport Harbor, from September 3 through October 10, specimens in excellent condition were taken on goldenrod and aster. Such profusion hereabouts was previously unknown.

E. claudia Cram. is a species that has been taken in single specimen captures during recent years. September and October were favorable periods in 1945 at Westport Harbor, Massachusetts. In company with *J. coenia* on the shore of Cockeast Pond, from September 3 through October 8, two dozen specimens including both sexes were taken. Single specimens were taken in Little Compton, Rhode Island, and Fall River, Massachusetts on the shore of the Taunton River.

THE SPECIES OF THE GORYTINE GENUS TRICHOGORYTES (HYMENOPTERA, SPHECIDAE).

By V. S. L. Pate, Ithaca, New York.

The Gorytine wasps have several very poorly known genera in the Nearctic Region. The genus *Trichogorytes* is one of the smaller and least known of these groups.

Trichogorytes Rohwer.

Harpactus Ashmead, Ent. News, X, p. 10 (1899); [*nec* Shuckard, 1837].—Ashmead, Canad. Entom., XXXI, pp. 324, 328 (1899); [in part, *nec* Shuckard].

Trichogorytes Rohwer, Proc. U. S. Nat. Mus., XLI, p. 469 (1912).—Rohwer, Proc. U. S. Nat. Mus., LIX, p. 412 (1921).—Pate, Mem. Amer. Ent. Soc., no. 9, p. 66 (1937).

Gorytes (*Gorytes*) Maidl & Klima, Hymen. Catal., pt. 8, p. 58 (1939); [in part, *nec* Latreille].

Gorytes (*Trichogorytes*) Maidl & Klima, Hymen. Catal., pt. 8, p. 114 (1939).

Genotype: *Trichogorytes argenteopilosus* Rohwer, 1912. (Monobasic and by original designation.)

The heavy white tometum of the head and thorax readily distinguishes *Trichogorytes* from all other Nearctic Gorytine wasps with the exception of *Hapalomellinus* and some species of *Dienoplus*. However, the stockier, more robust build, sessile abdomen, parallel inner eye orbits and well-developed episternal suture and episternaulus differentiate *Trichogorytes* from *Hapalomellinus,* and the lack of sternauli will separate it from *Dienoplus*.

Generic Characters.—Moderate-sized forms, with the head, thorax and legs clothed with a dense vestiture of appressed white tomentum, and the abdominal tergites with tomentose white fasciae. Head with face broad, the inner orbits straight, parallel or subparallel. Ocelli normal, rather large, the postocellar line longer than the ocellocular distance. Occipital carina almost a complete circle in extent, but not directed toward nor attaining the hypostomal carinule. Antennae situated toward middle of face; scapes short, thick; flagellum elongate, simple, not clavate. Mandibles large, heavy, apices dentate.

Thorax with pronotum short, ecarinate; mesonotum, axillae, scutellum and postscutellum simple; mesonotal laminae small.

Mesopleura with episternal suture present, distinct, running obliquely downward from below tegulae; episternauli present; sternauli absent; omauli absent or very indistinct. Mesosternum rounded, immarginate, ecarinate anteriorly. Propodeum finely sculptured or punctate at best; dorsal face with a trigonal enclosure; lateral carinae and stigmatal grooves absent.

Fore wings with the recurrent veins received well within the second submarginal cell. Hind wings with cubitus arising distinctly beyond the short, straight transverse median vein.

Legs simple. Tarsi with last segment abruptly swollen. Fore tarsi of females with a pecten of very long, flattened, spatulate, flexible bristles. Middle and hind tarsal segments with apical whorls of strong spines. Middle tibiae with two calcaria. Middle and hind tibiae with a few spines on outer faces.

Abdomen sessile, stoutly fusiform, not constricted between the segments, and impunctate or at best finely acupunctate. Females with a flat trigonal pygidial area on last tergite.

Trichogorytes is known at present from the female sex only. But I do not believe that the discovery of the males will cause us to modify materially our concept of the genus.

Distribution.—The genus *Trichogorytes* is a small precinctive Nearctic group apparently confined to the xeric areas of the southwestern United States. At present only two species are known which may be referred to it.

Trichogorytes cockerelli (Ashmead).

Harpactus cockerelli Ashmead, Ent. News, X, p. 10 (1899); [♀; Mesilla Park, N. M.].—Ashmead, Canad. Entom., XXXI, p. 328 (1899).

Gorytes (*Gorytes*) *cockerelli* Maidl & Klima, Hymen. Catal., pt. 8, p. 58 (1939); [with *Gorytes cockerelli* Rohwer, 1909 [= *Lestiphorus cockerelli* (Roh.)] recorded as a synonym!].

Type.—♀; Mesilla Park, Dona Ana County, New Mexico. Elevation, 3865 ft. June 9, 1898. (T. D. A. Cockerell.) [United States National Museum, Cat. no. 5071.]

The present species is clothed with a silvery tomentum which, however, is not as dense as that of *argenteopilosus*. Moreover, the pygidial area of *cockerelli* is glabrous, polite, and has only a few scattered punctures, while the propodeum has the trigonal enclosure, the posterior face and the upper lateral angles finely rugulate, and the omaulus on the mesopleura, although obsolescent, is faintly indicated.

This species is still known only from a unique female taken in southern New Mexico.

Trichogorytes argenteopilosus Rohwer.

Trichogorytes argenteopilosus Rohwer, Proc. U. S. Nat. Mus., XLI, p. 470 (1912) ; [♀; "Hot Springs, Arkansas"].

Gorytes (*Trichogorytes*) *argenteopilosus* Maidl & Klima, Hymen. Catal., pt. 8, p. 114 (1939).

Type.—♀; Castle Creek Hot Springs (25 miles east of Wickenberg), Yavapai County, Arizona. Elevation, 1970 ft. June 26, 1901. (E. A. Schwarz and H. S. Barber.) [United States National Museum, cat. no. 14169.]

The head and thorax of *argenteopilosus* are densely and heavily clad with strongly appressed white tomentum, while the abdomen has similar pubescent bands on all the tergites, the basal halves of which are glabrous. The pygidial area of the present species is likewise pubescent and finely punctate throughout. The mesopleura of *argenteopilosus* lack any trace of an omalus and the propodeum has the trigonal enclosure and the posterior and lateral faces merely finely punctate.

This species is also known from only a unique female, which Rohwer incorrectly recorded from Hot Springs, Arkansas. However, Mr. H. S. Barber, who collected the specimen, has informed me that it was taken at Castle Creek Hot Springs in Arizona, and I take this opportunity to rectify the error.

CATS EAT GRASSHOPPERS.

By G. F. Knowlton, Logan, Utah.

Arriving in Phoenix, Arizona, on the night of May 4, 1945, the writer was impressed by the large numbers of grasshoppers present on and around street-light poles, coming to neon lights and littering the streets of the business district wherever such were well lighted. Three boys were noticed, walking along the sidewalk, catching grasshoppers and stuffing them into already well filled "coke" bottles, of which each carried at least two. Grasshoppers collected by the writer proved to be *Trimerotropis citrina* Sc. (det. H. K. Townes).

A walk was taken about the city to observe insect conditions at the lights. About 45 yards north of the Westward Ho Hotel, near and beneath the windows and in the doorway of a flower shop, large numbers of grasshoppers were present and thousands of grasshopper fragments were strewn about. A nearly half-grown "brindled" cat was methodically catching and eating the winged *Trimerotropis;* this cat consumed 32 during the first 15 minutes of observation. This reminded the writer of a cat which was eating grasshoppers which came to street lights at St. George, Utah, during early May of 1943. In this instance, nearly all of the grasshoppers present were *Trimerotropis latifasciata* Sc. and *T. vinculata* (Sc.). On another occasion a cat was similarly observed to eat a number of adult *Trimerotropis* attracted to service station lights during spring at Salina, Utah.

Dozens of Staphylinidae were present, wandering about among the grasshopper fragments by the floral shop at Phoenix, and a number were collected. These were identified by Milton W. Sanderson as *Philonthus alumnus* Er. and *Erichsonius paederoides* (Lec.); also one specimen picked up was a male *Apocellus sphaericollis* (Say). These rove beetles also wandered along the edges of the windows, margins of the foundation, and crawled beneath the screen door. As new individuals arrived they lit upon the windows, walls and sidewalk.

Chrysopa adults often were moderately numerous upon lighted store windows and on walls, as also were *Nabis* adults. Four *Nabis alternatus* Parsh were present on the flower-shop windows upon first observation; one of these was feeding on a small green *Empoasca* leafhopper.

A similar survey of the same windows and street lights was made during the evening of May 5, covering the same streets and hours.

At this time *Trimerotropis* were conspicuously less abundant. The same cat again was present in front of the flower-shop window, catching and eating grasshoppers as they came within reach, and keeping the grasshopper numbers very low at this place.

Probably the large number of insects present at the flower shop may largely be accounted for by the shop being a well-lighted place on the outskirts of the business district.

Neuroptera in Light Trap.—On the evening of August 30, 1945, a trap light was hung out of a west window next to the writers' office on the campus of the Utah State Agriculture College. A 200-watt globe was used in the small funnel-type trap. When the trap was taken in next morning it was observed that a large number of Neuroptera, and particularly Chrysopidae, were contained in this one-night catch. These specimens were layered down between cellucotton in pillboxes and sent to Dr. Roger C. Smith who reported on them as follows: 12 *Chrysopa plorabunda* Fitch, many *C. rufilabris* Burm., 2 *C. coloradensis* Banks, 12 *C. cockerelli* Banks, 12 *C. nigricornis* Burm., 16 *C. majuscula* Banks, 2 *C. oculata bipunctata* Fitch, 2 *C. oculata acarei* Smith, 4 *C. quadripuncta* Burm., and 1 rare *C. excepta* Banks. Two *Eremochrysa punctinervis* Banks, 6 *Meleoma verticallis* Banks, and 7 *M. emuncta* (Fitch) were present in the sample. In addition there were 5 Hemerobiidae and 1 Sympherobiidae. Four or five species of brown lacewings were present.

This collection was much larger in numbers and comprised more species than generally was collected in this light trap during 1945. However Chrysopidae have commonly occurred in light trap catches in Utah.—G. F. KNOWLTON, Utah State Agricultural College, Logan.

BOOK NOTES.

Brazil, by Mulford B. Foster and Racine Sarasy Foster. Pp. i–xi + 1–314; 137 photographs, not numbered, 4 color illustrations, and numerous sketches. (The Jaques Cattell Press, Lancaster, Pa. 1945. $3.00.)

In entomology today, we pay greater attention than ever before to the biology of insects, which is the key to their current control and possible future activity to the injury of men and his crops. This is an extraordinarly complex subject, since it has to evaluate and control the observed phenomena of insect life. Of course, this is a truism, but it is useful to emphasize it once in a while.

One of these elements is the ecology insects, which eventually furnishes the key to their development. It is from this standpoint that we here refer to a botanical work with popular implications.

Today, the Good Neighbor policy is much discussed (Mark Twain on the weather merits meditation at this point). Many books, deep or superficial, appear from day to day, and many articles the same in effect, all discussing the peoples south of the Rio Grande. But very little is said about their environment, and that mostly romantic and superficial. Very little is said about the natural features, the climate and the vegetation of these vast areas which lie in the Tropics, with extensions into the North Temperate Zone (Mexico) and the South Temperate (Argentine and Chile).

The highly interesting book by the Fosters is mentioned here on this basis, even though its mention of a few scattered insects (not by name) is insignificant. The couple hunted for Bromelias, whence a waterbug has been found, a *Microvelia,* in the water at the base of the leaf whorl. The main purpose of this note is to bring to the attention of entomologists this account of vegetation and climate in little-known parts of Brazil. How many of us have insects from its vast Tropical forests! But we know nothing of the plants on which such insects are found, nor of the surrounding conditions. This is likewise true of the Amazonian jungle of Perú, with a similar insect fauna, and of its elevated and temperate mountain plains. Naturally, as most collecting in these has been commercial, more attention has been paid to showy and readily marketable forms, as the *Morphos.* As an example of the neglect of other environments, up to a recent period only *five* species of Heteroptera had been recorded from the desert Pacific coast of Perú. This is changed now by the great entomological activity in Perú (Wille, Entomología Agrícola del Perú); and in Brazil where Costa Lima is publishing his great work on the insects of Brazil, with abundance of biological data.

This, of course, does not review the Fosters' book. But the work is recommended for an ecological background, and also for its very interesting own sake.

The Lost Woods, by Edwin Way Teale. Pp. i–xiii + 1–326; with 200 photographs. (Dodd, Mead & Co., New York, N. Y. 1945. $4.00.)

One of the most pleasant things about having a living interest in the protean manifestations of nature is in these times, that we are favored once and again by Teale's lovely books; and here is another, equally as fascinating as its predecessors. The one before us now is a series of separate sketches of the moods and manifestations of nature, which binds them together. The chapter from which the book takes its title, *The Lost Woods,* is a nostalgic memory of the woodland full of mysteries, where little Edwin passed to many happy and enchanting hours with his grandfather. Now, the woods are no more; the happy farm is gone; but they still live as a memory of enchantment. After all, the true life of man is in the mind, in which memory plays a deep part.

Other chapters range in time from the trilobites of the Silurian seas, 300,000,000 of years in the past, to their descendants of today, the king crabs, under the title of "The Return of the Fossils," down to the protection of the nearly vanished descendants of Archaeopteryx in the Florida Keys in our own day. In space, they range from the ocean to the sky, through beach and clouds and stars. A few of their titles perhaps will serve to indicate their content. "In the Heart of a Cloud" tells how it feels to be inside a misty tenuous, timeless, foggy, bumpy, silence, so vastly unlike its outer aspect, shining silvery in the sun. "The Striking Serpent" is an unfinished study of how fast a snake moves as it strikes. "On the Calm of the Stars" and "The Private Life of a Snowflake" take us into the silences of the far heavens, where there is no strife.

The selection of the more than 200 photographs shows not alone the possibilities of the camera as an interpreter of nature, but also the skill and art and the unerring vision of its master. The very fine printed reproductions bring out the subtle details very beautifully.

This is a most enjoyable book, a still moment in the hurly-burly of life today; it is a "must" to every one who seeks the peace of nature.

J. R. T.–B.

SMALL NOTES.

Here are a few papers and monographs that have come to our notice.

The Elateridae of New York State, by Henry Dietrich. Memoir 269, Cornell University Agricultural Experiment Station, Ithaca, N. Y. (1945.)

Dr. Dietrich's monograph is a necessity to the working coleopterist. Not alone does he give a classified list of species of click beetles, but he also gives keys to the genera and species, together with a brief description of each species. He says: "The object of the study has been to identify all the described species rather than to find new ones." Synonymical notes and directions for collection and preparation are briefly given.

* * *

Revision of the Nearctic Bibionidae Including Neotropical Plecia and Penthetria, by D. Elmo Hardy. Bulletin of the University of Kansas, vol. XXX, pt. II, no. 15, pp. 367/547, pls. XXIX–XLI. (1945.)

Dr. Hardy gives us an important monograph of the flies. It is an extremely useful work to dipterists, since it contains keys to the genera discussed, and to the species within the genera, as well as the original descriptions, or redescriptions where required, of all the species treated. The 23 plates of structures are excellent. In the expanding nature of science, this work is basic for the contained species, to grow in the years to come by new research.

* * *

The Environment, Life History and Structure of the Water Boatman, *Rhamphocorixa acuminata* (Uhler), by Melville E. Griffith. The University of Kansas Science Bulletin, vol. XXX, pt. II, no. 14, pp. 241/365, plates XVI–XXVIII. (1945.)

The water boatmen are a highly specialized group of the Cryptocerate Hemiptera, so much so, that the Corixidae have been set up as a separate order. In his outstanding monograph, Dr. Griffith gives the complete treatment of one of the species, which has the curious habit of depositing its eggs on the abdomen of crayfish. The environment, life history and skeletal structure of *Rhamphocorixa acuminata* are presented in great detail, with a great wealth of new matter. The 13 plates add distinctly to the usefulness of this paper.

J. R. T.–B.

PROCEEDINGS OF THE SOCIETY.

MINUTES OF THE MEETING OF APRIL 12, 1945.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on April 12, 1945.

The meeting was opened by President R. R. McElvare at 8:20 P.M.

Members in attendance were: Messrs. McElvare, Buchholz, Teale, Sheridan, Olsen, and Noaks.

The minutes of Nov. 16, 1944, and March 15, 1945, were approved as read.

The Treasurer made a satisfactory report on the financial proceedings of the Society for the period from Jan. 1 to March 31, 1945.

Mr. Chris Olsen said he would be able to talk before the Society in November on "Pearl Divers of the South Seas." The Society was greatly appreciative of the offer and accepted it wholeheartedly.

A motion was made by Mr. Noaks that the Secretary be put in charge of sending letters to those members of the Society who are within the City limits of New York in order to bring about a possible increase in attendance to the monthly meetings of the Society. The motion was seconded and passed.

The Program Committee reported that the topic of the meeting in May was to be, "The Possible Work of the Members to be Carried on This Summer."

The speaker of the evening was Mr. Chris Olsen who read a paper to the Society dealing with "Local Homoptera." A brief review of this paper follows.

The talk consisted of some of the fond recollections of the members of the Brooklyn Entomological Society when the Society was itself embryonic and was held in the rear of George Franck's store, The American Entomological Company in Brooklyn. Mr. Olsen brought out many interesting and humorous incidents of those days.

Mr. Olsen explained to the Society the various taxonomic groups that the Homoptera were divided into. The two main headings were classed as the Auchenorhyncha and Sternorhyncha. The Auchenorhyncha includes the Cicadidae, Cercopidae, Membracidae, Cicadellidae, and Fulgoridae. The Sternorhyncha includes the Chermidae, Aphidae, Aleyrodidae, Coccidae, and mealy bugs.

Specimens of the local forms of the Auchenorhyncha were displayed with this most interesting talk.

A general discussion period followed.

The meeting adjourned at 9: 30 P.M.

JOHN W. NOAKS, *Secretary.*

MINUTES OF THE MEETING OF MAY 10, 1945.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on May 10, 1945. The meeting was opened at 8: 15 P.M. with President Rowland R. McElvare in the chair. Members in attendance were Messrs. McElvare, Teale, Sheridan, and Noaks and Dr. Goodnight. The visitors included Mrs. Goodnight.

The minutes of the previous meeting were approved as read. The Secretary reported that the New York Entomological Society had extended a special invitation to the members of the Brooklyn Entomological Society to attend the annual field trip held at Mr. Chris Olsen's home in West Nyack.

The Treasurer submitted a satisfactory report.

The Program Committee reported that they had obtained speakers through December 1945.

Mr. Teale's report from the New York Academy of Sciences stressed whether or not the Society required floor space in the American Museum for supplies. It was decided that the Society would continue to store its supplies in the Brooklyn Museum.

A discussion followed dealing with increasing the membership of the Society.

The main topic of discussion centered around the members' plans for the coming summer, during which Mr. Teale showed several photographs including one of an hemipteron which supported a caterpillar many times its own weight by means of its mouthparts. In this position *Podisus sp.* sucked the body juices from the caterpillar.

The meeting adjourned at 9: 45 P.M.

JOHN W. NOAKS, *Secretary.*

MINUTES OF THE MEETING OF OCTOBER 11, 1945.

Minutes of a regular meeting of the Brooklyn Entomological Society held at the Brooklyn Museum on October 11, 1945, at 8: 15 P.M.

Members in attendance were: Messrs. McElvare, Teale, Buchholz, Sheridan, Gaul, Noaks, Drs. Risch and Goodnight. Visitors included Mrs. Goodnight and Mr. Comstock.

The minutes of the previous meeting were approved as read.

The Treasurer's report was accepted by the Society.

The death of Mr. Henry J. Dietz was reported. Mr. Dietz was a loyal member of the Society for many years and an enthusiastic lepidopterist. A resolution was adopted by the Society expressing its sorrow at his passing and the President was requested to send an expression of sympathy to Miss Dietz, who frequently accompanied him to the Society's meetings.

Mr. McElvare also stated that he had received a letter from the Zoological Society of London thanking us for previous donations. A motion was made that $5 should be sent to the Society; was seconded and approved.

Mr. Teale mentioned a letter from Mr. Mortimer D. Leonard who requested that the members send to him any additions to the "Insects of New York State" for a supplement which he is compiling.

The main topic of discussion concerned the summer collecting experiences of members.

Dr. Goodnight mentioned his trip through Cape May and some of his luck this collecting season.

Mr. Gaul illustrated several specimens of storage insects and mentioned that the collecting was good as far as the hymenoptera were concerned.

Mr. Teale described some of the fauna of New England and a certain tachinid parasite, *Achaetoneura archippivora,* of the monarch butterfly.

Mr. Comstock reported on several specimens which had been received by the American Museum during the war years from Okinawa and other South Pacific islands.

Mr. Buchholz related his recent experiences in the Dismal Swamp, noting the heavy rains and fairly good collecting. He also mentioned his success with methyl phthalate as an insect repellent.

Dr. Risch talked briefly on his vacation to Lake Mohonk but stated that he had done little collecting.

Mr. Sheridan led a discussion on D.D.T., mentioning some interesting points pro and con.

Mr. McElvare reported on his trip to Coram, L. I., and to upper New York State with emphasis on the varying faunas.

The meeting adjourned at 10: 15 P.M. following a discussion on the distribution and flight habits of the monarch butterfly.

JOHN W. NOAKS, *Secretary.*

MINUTES OF THE MEETING OF NOVEMBER 15, 1945.

Minutes of a regular meeting of the Brooklyn Entomological Society held at the Brooklyn Museum, Thursday evening, November 15, 1945, at 8: 15 P.M.

Present Messrs. Buchholz, Naumann, Olsen, Dr. Risch, Sheridan, Teale, McElvare, and six visitors.

In the absence of the Secretary, the reading of the minutes of the previous meeting was deferred.

Mr. McElvare reported that word had been received from Washington that Mr. Engelhardt's Aegeriid Manuscript had been sent to press by the Smithsonian and that publication was expected early in 1946.

Mr. Teale stated that the Cicada types of Mr. W. T. Davis were being transferred from Staten Island to the American Museum of Natural History.

Mr. Chris E. Olsen, a member of the Society since 1907, spoke on his pre-war experiences collecting pearl shell in the south Pacific in connection with the preparation of a large Pearl Diver Group for the Hall of Oceanic Life at the American Museum of Natural History. Leaving the Hawaiian Islands on the Templeton Crocker sailing yacht "Zaca," a 100-foot schooner, the first stop of the expedition was Christmas Island. It was found unsuited and inconvenient for pearl-diving work. After a brief stop of a few hours, the voyage was continued to Tongareva, one of the Cook Islands. Tongareva is a ring atoll, lying some two thousand miles south of Honolulu, in longitude 158° west, about ten degrees south of the Equator. Conditions at Tongareva were found to be very favorable and the pureblood Polynesian inhabitants most cooperative in guiding the expedition to suitable locations and aiding in the diving. Eighteen strenuous days were spent collecting tons of material from the waters around the island. On the return trip to Honolulu, stops were made at Pago Pago and Savaii Island, Western Samoa.

A little collecting of insects was done on all the island stops insofar as time permitted. Christmas Island was by far the poorest collecting place of all. None of the places visited yielded anything in abundance. Contrary to expectation, these small islands are hard to work, when it comes to collecting insects.

In collecting material and data for the Pearl Diver group, Mr. Olsen made numerous descents to the sea floor adjacent to Tongareva and made underwater paintings on specially prepared canvas mounted on glass. Using a diving helmet, it was possible to work for about a half hour at a time at a depth of twenty-five feet. Mr. Olsen described a number of interesting incidents. As an illustration of the cooperation of the natives, he cited their prying loose a thousand-pound specimen of coral, sinking a small boat into which it was manipulated on the sea floor, and then dragging the boat up to the tide line where it was baled out and the coral ferried out to the schooner. Mr. Olsen's talk was illustrated by a number of fine kodachromes, picturing many forms of undersea life, including a series showing various types of pearl shell. Following his talk there was a general discussion of pearl culture in other parts of the world, notably Japan and the Red Sea.

The meeting adjourned at 10:00 P.M.

ROWLAND R. MCELVARE, *Secretary of the Meeting.*

EDITORIAL.

On Helping the Editor—No. 2.

Years ago we expressed ourselves more or less at length on this topic of Helping the Editor. The gist of what we said at that time was, that all suggestions as to format and style placed by authors on the MSS were either unnecessary or unwanted. If such indications are in agreement with the established form of the journal, they are works of supererogation; if they differ, they act merely to compel the editor to eliminate them and to mark the copy to conform with the fixed standards of the journal.

Each detail of every publication is carefully thought out and is based on a valid reason, from the size of the page and the size of type and style of typography, to the arrangement of articles on a page or within a number. No journal is a mere haphazard jumble of styles of type, headings, or sequence of articles.

When an author submits a MS to an editor, he should thoroughly understand that so long as the article as printed follows his wording, everything else about it must conform to the established principles and forms of the publication in which it appears.

J. R. T.-B.

EXCHANGES AND FOR SALE.

This page is limited to exchange notices and to small For Sale advertisements from members of the Society and from actual paid subscribers to the Bulletin exclusively. *Exchange notices* from members of the Society and from subscribers are limited to *three (3) lines each,* including address; beyond 3 lines, there will be a charge of $1.00 for each 3 lines or less additional. *For Sale* ads will be charged at $1.25 for each 3 lines or part of 3 lines. *Commercial or business* advertisements will not be carried in this page, but will go in our regular advertising pages at our regular advertising rates to *everybody.*

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Vol. XLI APRIL, 1946 No. 2

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BULLETIN

OF THE

BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XLI April, 1946 No. 2

THE NEARCTIC SPECIES OF ITEAPHILA AND APALOCNEMIS.

By A. L. Melander, Research Associate, The University of California, Riverside, California.

In Curran's Manual of the Genera of Diptera the following species lead to *Iteaphila,* Couplet 30 of the family Empididae. The flies are alpine for the most part, sometimes locally abundant for a few days hovering over the flowers of willow, currant or wild cherry.

There has been much confusion regarding the identity of the species of *Iteaphila,* not only of the American forms but also those of the Palaearctic region. There is sometimes great sex dimorphism, considerable variability, and apparently at times an enormous range of discontinuous distribution. The earlier described species of Walker and Kirby are so briefly characterized that in the absence of types it is sheer guess-work to make identifications. While some twenty species of *Apalocnemis* have been described from South America the genus has hitherto not been known to occur in North America.

In the following records the specimens have been collected by myself, unless otherwise indicated. Types of the new species are located in my collection. The scattered distribution record is undoubtedly the result of the brief appearance of the adults, coinciding with the springtime blossoming of their favored flowers. Collecting done at any other time would miss the Iteaphilas.

Distinction Between Iteaphila and Apalocnemis.

Iteaphila Zetterstedt.

Third antennal joint elongate, strap-shaped, but slightly tapering, three or four times as long as basal depth, the style minute and tipped with a microscopic hair, basal joints of antennae nearly bare; palpi slender, with loose hairs or nearly

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bare, proboscis porrect, usually about as long as the height of the head; pygidium terminal, the penis and penis-sheath curving or bent backwards, the principal valve lateral, basal dorsal valve appendiculate; female abdomen conical, ending in a pair of distinct slender styles; ambient vein undeveloped.

Apalocnemis Philippi.

Third antennal joint short-oval, as long as deep, ending in a thickened aristiform style, which in our species is nearly three times the length of the third joint, basal joints of antennae strongly setose; palpi subclavate, strongly setose, proboscis much shorter than the head-height; pygidium somewhat compressed, round in outline and reflexed, the penis and penis-sheath curving forward, no lateral valve, basal dorsal valve without appendage; female abdomen posteriorly bluntly compressed, the terminal styles small, short and wide; ambient vein strong.

KEY TO THE NEARCTIC SPECIES OF ITEAPHILA.

1. Males: eyes contiguous; abdomen ending in valvate genitalia 2
Females: eyes widely separated; abdomen conical, ending in a pair of styles 10

2. Pygidium much larger than segments 5 and 6, main valve rather oblong, wide at apex, basal valve erect and very thin, penis-sheath curving downwards posteriorly around end of main valve (fig. 1); base of antennal style square. (U. S., Can.) .... **I. americana,** n. sp.
Pygidium much smaller, main valve rather triangular, with more or less pointed backward-directed apex, which sometimes is infolded, penis-sheath not encircling main valve (fig. 2) 3

3. Keel of pygidium provided with a caudal bunch of rather long black setae; proboscis 1.5 to 2 times head-height; 10 scutellars; body rather polished. (Alaska, B. C., Wash., Mont.) .... *I. triangula* Coquillett
Keel of pygidium with scattered hairs; proboscis usually about as long as head, or shorter, but longer than head in *fuliginosa* 4

4. Dorso-basal valve of pygidium short and broad, shaped like a boxing glove; fork of third vein at or beyond end of second vein; sides of notum with abundant fine hair; about 20 scutellars. (Rocky Mts., Wash.)
I. orchestris Melander

Dorso-basal valve pointed, higher than wide (if more or less mitten-shaped and hairs of body pale, see *vetula*); fork of third vein usually distinctly before end of second vein 5

5. Scutellum with about 8 to 12 marginal bristles; mesonotum with inconspicuous hairs; legs fuscous; wings hyaline or subhyaline 6

Scutellum with about 14 to 20 marginal bristles, if fewer the wings are infumated 7

6. Hairs of thorax and abdomen pale, thorax gray when seen from in front. (Wash., Ida.) .... **I. vetula,** n. sp.

Hairs of body black, irregularly scattered; wings subhyaline. (Alaska) .... *I. conjuncta* Coquillett

7. Notum fulvous when seen from front, hairs and bristles black 8

Notum hoary when seen from front, hairs of notum and abdomen long and white. (Alta.) .... **I. cana,** n. sp.

8. Sides of notum with abundant long fine hair, acrostichals in 4 irregular rows; base of antennal style oblong 9

Notum with only minute inconspicuous hair, acrostichals microscopic, irregularly biseriate; base of style square; wings infumated. (Wash., Ida., B. C.) ...... **I. napaea,** n. sp.

9. Proboscis about as long as head-height; wings subhyaline, veins heavy. (Northern States, Can.)
I. Macquarti Zetterstedt

Proboscis longer than head-height; wings fuliginous, veins thin. (Wash., Or.) .... **I. fuliginosa,** n. sp.

10. Front glistening black 11

Front hoary and dull 15

11. Thorax cinereous when viewed from front; about 12 scutellars 12

Thorax black, subshining, sometimes lightly dusted; usually less than 12 scutellars; proboscis usually shorter than head-height; base of antennal style square; wings lightly fuliginous, fork of third vein before end of second (if third vein is forked beyond second vein see *orchestris*). (U. S., Can.) .... **I. americana,** n. sp.

12. Bristles and hairs white, even those of scutellum. (Wash., Ida.) .... **I. vetula,** n. sp.

Bristles and hairs black 13

13. Legs yellowish; dorsocentral and acrostichal rows less pollinose than remainder of notum; basal joint of antennal

style square; veins yellowish. (Wash., Ida., B. C.) **I. napaea,** n. sp.

Legs mostly black; basal joint of style oblong; veins fuscous 14

14. Third vein forked beyond end of second vein, veins thin. (Western) .... *I. orchestris* Melander

Third vein forked before end of second vein, veins coarse. (Eastern) .... *I. cormus* Walker

15. Thorax and abdomen black in ground color, viewed from front dull hoary 16

Thorax, abdomen and legs testaceous; proboscis shorter than head; 6 to 8 scutellars; discal cell as long as last section of fourth vein. (Ida.) .... **I. testacea,** n. sp.

16. Bristles and hairs of thorax black, about 18 scutellars 17

Bristles and hairs of body whitish, scutellum with fewer bristles; base of antennal style oblong. (Alta.) **I. cana,** n. sp.

17. Proboscis equal to head-height, labella fleshy; base of antennal style oblong; discal cell longer than last section of fourth vein, sections of fifth vein proportioned 3:1; hairs of abdomen white. (Northern States, Can.) *I. macquarti* Zetterstedt

Proboscis longer than head, thin; base of antennal style almost invisible; discal cell equal to last section of fourth vein, sections of fifth vein 2:1; hairs of abdomen black, sparse. (Alaska, Wash., Mont.) .... *I. triangula* Coquillett

LIST OF THE SPECIES OF *Iteaphila*, WITH NOTES AND DESCRIPTIONS.

Iteaphila americana, n. sp.

Black over all. Occiput shining, its hairs moderately sparse to rather abundant; proboscis slender, porrect, not exceeding the head-height; palpi shorter than the proboscis. Dorsum of thorax viewed from front or behind lightly dusted with brownish, from above almost matte, acrostichals minute, anterior dorsocentrals merging with the very sparse lateral hairs. Abdomen shining, hairs shorter than the segments, sometimes pale, lateral valves resembling half of a canoe with upturned stern (see fig. 1). Legs without conspicuous hairs. Wings moderately infumated, the stigma darker, discal cell rather blunt, third vein forking before the end of second, the anterior branch ending midway between the second and third veins, sections of fourth vein proportioned 1:2:3 to 1:3:4, of fifth vein 2:1; alulae and fringe blackish, halteres black. Length 3 mm., rarely 4 mm.

Female. Head and body more shining black, legs piceous, alulae fuscous, wings subhyaline.

Holotype and allotype collected at the Thumb of Yellowstone Lake, Wyoming, 16 VII, 1923, on flowers of mountain ash. Eighteen male and thirty-five female paratypes. WASHINGTON: Skyline on Mount Baker, 10 VIII; Paradise on Mount Rainier, 28 VI; van Trump on Mount Rainier, 21 VII; Tacoma, 27 V; Olympia, 31 III (T. Kincaid); Seattle, 17 III to 15 IV (Kincaid); Ilwaco, 25 V; Snoqualmie Pass, 29 VI; South Bend, 23 V; Nahcotta, 24 V; Deer Park, 5 V. IDAHO: Lake Waha, 9 VI; Moscow Mountain, 17–25 VI. BRITISH COLUMBIA: Vancouver, 13 V (R. S. Sherman). OREGON: Mt. Hood, 25 VI. MONTANA: Grinnell Lake in Glacier National Park, 24 VII. COLORADO: Monarch Pass, 11,400 ft., 21 VI. NEW MEXICO: Las Vegas Mts., 11,000 ft., June (T. D. A. Cockerell). MISSOURI: Atherton, 13 IV (C. F. Adams). QUEBEC: Aylmer, 28 V (C. H. Curran).

This is certainly the Nearctic expression of the European *I. obscura* Zetterstedt as interpreted by Frey. The points of difference as gleaned from Dr. Frey's detailed description of Zetterstedt's species are here shown.

	obscura	*americana*
Proboscis	Short	About equal to head
Ac and Do bristles ..	In several rows	Uniserial
Sc bristles	16–20	10–14
Penis	Yellow	Black
Veins	Strong	Thin

However, there is doubt whether Frey's species is the same as Zetterstedt's because the original description called for a dichoptic male *Hilara* with rather wide front. Even if Zetterstedt had mistakenly used a female, which is quite possible because Frey found only a female in the type collection, the whitish halteres, short antennae with ovate-conical third joint, and the somewhat thickened front femora would preclude the present species. For these reasons the Nearctic specimens are given their own specific name.

Iteaphila cana, n. sp.

Occiput lightly cinereous, its hairs black, moderate; basal piece of antennal style oblong; proboscis equal to head-height; palpal hairs long but sparse. Thorax opaque, cinereous, no glistening spot on pleura; anterior dorsocentrals abundant, last three fine, long and black, acrostichals numerous, irregular, biseriate, about 20 black scutellars, lateral hairs abundant and pale, lateral bristles delicate and black, humeri hairy, the humeral bristle hair-like. Abdomen cinereous, subshining, hairs as long as the segments; pygidium nearly bare, the dorsal valves elongate triangular, with dusky hairs, the appendage long. Knees yellowish, hairs of legs pale, those of femora longer than the diameter of the joints. Wings subhyaline, stigma elongate, fuscous, veins firm and fuscous, discal cell blunt, third vein forked just before end of second vein, the anterior branch ending at two-fifths the space between the second and third veins, sections of fourth vein proportioned 1:4:4, of fifth vein 2.5:1; alulae pale, the fringe whitish; halteres black with fuscous stalk. Length, 3.75 mm.

One male and three females, Edmonton, Alberta, 26 IV, 1931 (E. H. Strickland) and one female, Fawcett, Alberta, 8 V, 1934 (Strickland). The females have the proboscis short and fleshy, the femoral hairs short, and the thoracic hairs short and sparse.

Iteaphila conjuncta Coquillett.

Described as doubtfully an *Empis* from three small specimens from Sitka and Orca, Alaska. I have a male from Moscow Mountain, Idaho, which may be the same.

Iteaphila cormus Walker.

C. W. Johnson identified specimens of an *Iteaphila* from Mount Washington, New Hampshire, as *Empis cormus* Walker, which originally was collected in the Hudson Bay Region. It is quite possible that *cormus* is an *Iteaphila,* but Johnson's species is different, lacking vittae on the thorax. As I have only females of Johnson's species I am not redescribing it as new, but include the species in the key under Walker's name.

Iteaphila fuliginosa, n. sp.

A large, black, hairy species with dark wings. Occiput hairy, very lightly dusted. Dorsum of thorax quite matte, when viewed from front or rear showing a coating of fulvous pollen, humeri and posterior calli castaneous, pleura lightly cinereous, without shining spot; dorsocentrals fine, irregularly placed in a band, scutellum with supplementary hairs above the full marginal row, no humeral bristle, lateral bristles small.

Abdomen with thin brown dust, the hairs rather abundant, nearly as long as the individual segments. For the pygidium see fig. 2. Legs rather hairy, the hairs of the femora longer than their diameter. Stigma of wings very dark; second vein long, making the first submarginal cell half as long as the second along the costa, sections of fourth vein 1 : 5 : 5, of the fifth vein 3.75 : 1; alulae fuscous, halteres black, with piceous stem. Length 6 mm.

Six males. Holotype, Seattle, Washington, received from Professor O. B. Johnson, under Coquillett's determination as *Empis luctuosa* Kirby; one male from Mary's Peak, Oregon, 8 III (D. A. Wilbur).

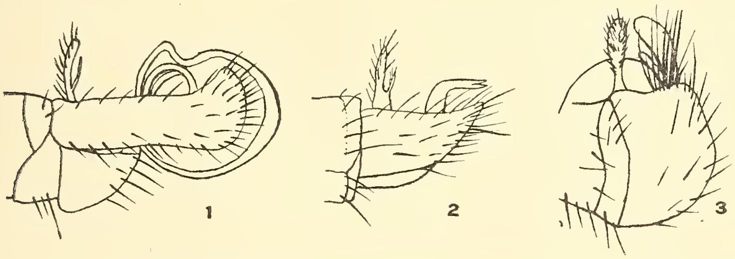

Fig. 1. Pygidium of **Iteaphila americana,** n. sp., showing the canoe-shaped lateral valve, the appendiculate basal valve and the large encircling penis and sheath. Fig. 2. Pygidium of **Iteaphila fuliginosa,** n. sp. Fig. 3. Pygidium of **Apalocnemis hirsuta,** n. sp., showing the thin forward-curving penis, the claviform basal dorsal valve, the small posterior valve, the heavy, blunt penis-sheath, and the globose hypandrium.

Iteaphila luctuosa Kirby.

Coquillett identified specimens of the preceding species from Washington State as *Empis luctuosa* Kirby, which was originally described from Eastern Canada. According to Coquillett, Kirby renamed the female of this dimorphic species *Empis geniculata.*

Iteaphila macquarti Zetterstedt.

This is the genotype of *Iteaphila,* occurring in Northern Europe, Siberia and America. It has been reported from Quebec and from New Hampshire. I have specimens before me from the following western localities. Colorado: Pikes Peak, 19 VI. Alberta: Banff (C. B. D. Garrett). British Columbia: Vancouver (R. S. Sherman); South Fork (R. P. Currie). Washington: Olympia

(T. Kincaid); Snoqualmie Pass, 29 VI. OREGON: Three Sisters Mts. (H. A. Scullen); Mt. Hood, 25 VI. The species occurs on *Salix* flowers, both in America and in Europe, a habit which prompted the formation of the genus name, for *Iteaphila* literally means fond of the willow.

Iteaphila napaea, n. sp.

> Brownish black, bristles and hairs black, legs dark fuscous, wings quite smoky. Occiput lightly dusted with brown, the hairs moderately dense and short; proboscis much shorter than head, palpi nearly bare. Mesonotum when seen from front, side or rear coated with fulvous pollen, in oblique view from front the acrostichal and dorsocentral stripes resume the dark ground color, from above the notum is almost matte brownish black, pleura lightly and uniformly dusted; usually 14 scutellars, lateral hairs of notum minute and scattered, lateral bristles short. Hairs of abdomen almost equal to length of segments, scattered; upper valves of pygidium narrowly triangular, the appendage short, penis fuscous. Legs simple, slender, the femoral hairs shorter than the diameter of their joints. Stigma and veins castaneous, veins thin; third vein forked at or before the end of the first vein, the second submarginal cell wider than the first along the costa, sections of fourth vein proportioned 1 : 5 : 6, of fifth vein 3 : 1; halteres and alulae blackish. Length 3.5 mm.
>
> Female. Quite different from the male, the mesonotum distinctly gray pollinose, the pollen like decumbent fur with the direction of inclination producing color changes according to the angle of view, the dorsocentral and acrostichal rows show distinctly in oblique view; legs, abdomen and halteres usually almost testaceous, as also sometimes the prothorax, humeri, pteropleura and coxae; alulae and veins at base yellowish.

Six males and twenty-one females, some of them collected from blossoms of wild cherry. Holotype and allotype from Lake Waha, south of Lewiston, Idaho, 9 VI, 1918. Paratypes from Summerland on Mount Rainier 24 VII, 1924; Tacoma, 27 V, 1917; Loon Lake, Wash., 16 V, 1924; Valleyford, Wash., 29 V, 1911; Kaslo, B. C. (R. P. Currie).

Iteaphila orchestris Melander.

Described from Las Vagas Range, New Mexico. I have additional specimens from the following localities. COLORADO: Fort

Collins (N. Banks collection); Monarch Pass, 8,000 ft., 21 VI, 1942. ALBERTA: Banff (N. B. Sansan); Lake Louise, 29 VII, 1935. BRITISH COLUMBIA: Emerald Lake, 30 VII, 1935. WASHINGTON: Mount Rainier, various stations, July and August.

(*Iteaphila*) *peregrina* Melander.

For this species from San Diego, California, I erected *Acallomyia,* a new subgenus of *Empis,* in Genera Insectorum, fasc. 185, 1927.

Iteaphila testacea, n. sp.

> Female. Head black, subpruinose; thorax, abdomen, legs and halteres testaceous. Antennae black, base of style square; mouthparts black. Mesonotum not shining, lightly pruinose when viewed from front; last two dorsocentrals long, the others minute, acrostichals minute and biseriate, lateral setae distinct, lateral hairs sparse and minute. Abdomen nearly bare. Legs slender, with no conspicuous hairs. Wings hyaline, veins testaceous at base, apically becoming brownish, stigma weak; discal cell narrow, third vein forked before end of second vein, the branch ending almost midway between the ends of the second and third veins, sections of fourth vein proportioned 1:3:4, of fifth vein 2:1. Length 3 mm.

Three specimens from Lake Waha, Idaho, 9 VI, 1918 and one from Bovill, Idaho, 18 VI, 1911. This cannot be a pale mutant of any of the other species.

Iteaphila triangula Coquillett.

This species was originally described as an *Empis* from Lowe Inlet, B. C., and several places in Alaska. It occurs on flowers of salmon-berry. I have identified it also from the following localities. BRITISH COLUMBIA: Vancouver (R. S. Sherman). WASHINGTON: Tacoma, 12 IV, 1913. Glacier National Park, Grinnell Lake, 24 VII, 1935. One female from Western Washington is apparently a yellow mutant. Its body and legs are testaceous, superficially resembling the preceding species.

Iteaphila vetula, n. sp.

> Occiput lightly dusted, its hairs short, sparse and pale; base of antennal style square; proboscis shorter than head-height, palpi nearly bare. Thorax lightly dusted; anterior dorsocentrals minute, irregular and uniserial, acrostichals biseriate, lateral hairs sparse but rather long, merging with the side

bristles. Abdomen shining, its hairs fine, rather sparse but nearly as long as the segments; pygidial hairs short and sparse, the upper valves broadly triangular and with short thumb. Legs pale fuscous, hairs of femora whitish and about equal to their diameter. Wings clear hyaline, veins fuscous, yellowish at base, stigma fuscous; discal cell broad and blunt; third vein forked opposite the end of the second vein, the branch ending about one-third the costal distance between the second and third veins, sections of fourth vein proportioned 1:4:4, of fifth vein about 2:1; alulae yellowish, halteres blackish, the stem fuscous. Length 3.75 mm.

Holotype collected at Loon Lake, Washington, 16 V, 1924. One male paratype taken with the holotype and two males from Craig's Mountain, Idaho, 8 VI, 1918.

A female from Kettle Falls, Washington, 3 V, 1912, has a shorter stigma, more dorsocentral setulae, the fork of the third vein before end of second vein, and femoral hairs shorter.

CHARACTERIZATION OF THE NORTH AMERICAN SPECIES OF APALOCNEMIS.

Eyes of male microscopically pubescent (hard to see when head is shrunken), contiguous two-fifths the distance below the ocelli, leaving a small, opaque, narrowly triangular front, scarcely indented at antennae, the upper facets moderate and merging into the smaller lower ones; front of female rather wide, without bristles; ocellar triangle prominent, with four hairs; mouthparts fleshy, short, directed forward in both sexes. Thoracic bristles long but not strong, pleura bare except for a few setulae above front coxae; 1 hum., 1 intrahum., 1 posthum., 3 npl., a varying number of supra-alar hair-like bristles. Pygidium compact, with two sets of small dorsal valves, penis-sheath stubby, curving forward between the posterior dorsal valves, penis hidden in most of the specimens, when exserted very slender and uniformly curving forward to encircle the base of the pygidium on the left side. Legs simple, slender, with no long setae. Anal lobe of wing full, axillar angle openly rounded and about 100 degrees, veins firm, stigma pronounced, auxiliary vein straight, attaining costa, third vein forked much before end of second vein and ending at wing-tip, anal vein represented by a fold.

If, as J. E. Collin believes, my New Zealand genus *Timalphes* is the same as the South American *Apalocnemis* it would seem that the extension into North America came from the Southern Hemisphere. Although *Timalphes* presents a very different appearance from the new species here described, being dull-colored with few stiff setae, the salient generic characters are the same and coincide with those given by Collin for the South American forms. The differences are no greater than those to be found when comparing extreme species of *Empis* or of *Rhamphomyia.* However, the resemblance of the new species to the Iteaphilas in habitus, habits and distribution lead one to think that both may have been derived from some boreal group, and that the placement with the southern forms is the result of an artificial classification.

KEY TO THE NEARCTIC SPECIES OF *Apalocnemis.*

Anterior dorsal valve of pygidium smaller than posterior valve; 6–8 scutellar bristles, 7–12 dorsocentrals, about 8 bristles above notopleural suture; none of abdominal hairs as long as segments. (Cal.) .... **A. oreas,** n. sp.

Anterior dorsal valve larger than posterior valve; 10–16 scutellars, 13–15 dorsocentrals, 12–20 bristles above notopleural suture; many abdominal hairs as long as segments. (Oreg.) **A. hirsuta,** n. sp.

Apalocnemis oreas, n. sp.

Black, subshining, hairs long and abundant. Occiput hairy, the hairs longer than the third antennal joint; palpi bristling with numerous setae, longer than proboscis. Thorax shining black, sometimes showing a very slight cupreous tinge, pleura very lightly gray-dusted; acrostichals long, biseriate, alternating, about 6 to the row, usually 6 scutellars. Abdomen very lightly dusted, quite polished; pygidium polished, the keel (hypandrium) compressed, carinate behind, antero-dorsal valves erect, hastate, setulose, without appendage, apical valves erect, oblong, obliquely truncate, penis filamentous, usually retracted. Legs of female less hairy than of male, male femora loosely seriately hairy above and below, the hind femora with decumbent hairs above toward knee, pulvilli white. Wings slightly infumated, veins black and strong, stigma elongate, sections of fourth vein proportioned about 1 : 3.5 : 5, sections of fifth vein equal; alulae and fringe black, halteres deep black. Length 4 mm.

Thirty-three males and nineteen females, collected at Big Pines Recreation Area, Los Angeles County, California, 23 V, 1945, elevation about 6500 ft., on flowers of *Ribes* growing at the edge of an alpine meadow. Latin, *oreas,* a mountain nymph.

Apalocnemis hirsuta, n. sp.

Very close to *oreas,* differing mainly in the greater development of the hairs, as indicated in the key. Thorax and abdomen more strongly dusted, when viewed from front, side or rear becoming opaque brownish. Pygidium robust, the hypandrium scarcely compressed and not carinate, both valves slenderly clavate, the posterior glistening, a lateral fringe of about 8 setae present on upper edge of hypandrium opposite base of posterior valve. Wings slightly more opaque than in *oreas,* the veins thinner. Length 4 mm.

Four males, Mount Hood, Oregon, at 5000 ft. elevation, 25 VI, 1935.

Mailing Date, February 1946 Bulletin Brooklyn Entomological Society, no. 1, vol. XLI.—The actual mailing date of this number was March 19, 1946. Authors of new species and bibliographers please make special note.—Editor.

BROCHYMENA OBSCURA (H.-S.), BROCHYMENA TENEBROSA WALKER, AND BROCHYMENA PARVA, A NEW NAME.

By Herbert Ruckes, New York, N. Y.

In 1839 Herrich-Schaeffer described a species of pentatomid under the name of *Halys obscura.* Later, when Amyot and Serville (1843) erected the genus *Brochymena* the species was placed there to become *Brochymena obscura* (H.-S.). Subsequently (1880) Distant put this species in synonymy with *Brochymena tenebrosa* Walker, which had been described in 1867. However, in 1837, Westwood had described another pentatomid under the name of *Halys obscura.* This species now belongs in the genus *Dalpada.* The *Halys obscura* of Herrich-Schaeffer is therefore a homonym of *Halys obscura* of Westwood and as such is an untenable name. To complicate matters still further, Distant synonymized *Dalpada obscura* (West.) with *Dalpada nigricollis* (West.), thereby eliminating the use of the specific name *obscura* altogether.

For many years certain specimens of the genus *Brochymena,* all from the southwestern states, have been identified as *Brochymena tenebrosa* Walk. by various authorities such as Van Duzee, Blatchley, Barber, *et al.* While studying numerous collections from museums and colleges over the country I found many that bore identification labels by these authors. When checking the actual specimens with Walker's original description and with Distant's figure of the species in the Biologia Centrali Americana, I became dissatisfied with these identifications and concluded that they were erroneous, and that the specimens did not represent the true species *Brochymena tenebrosa.* I submitted the problem to the late Mr. Van Duzee who sent me examples of what he considered to be *B. tenebrosa.* These were all similar to those I already studied in various collections. They were also the same ones that Van Duzee, many years earlier, had considered to be *B. obscura* (H.-S.). Again they failed to check completely with Walker's description, especially as to size, but they did conform to Herrich-Schaeffer's description of *B. obscura* in the nature of the pronotal denticles. Walker's species is said to be 8 lines long, i.e., 2/3rd of an inch or about 16 mm. All the identified specimens I have ever seen are much smaller than that, at the most 14 mm. long, and more likely they will be 13 mm. and sometimes 12 mm. in length. Herrich-Schaeffer's species is characterized by the possession of 3–4 wide-spaced and inconspicuous minute teeth on the pronotal margin, in contrast with a larger number of prominent and close serrations to be found in other species of *Brochymena.* All the examples of the species under consideration that I have examined are characterized by minute, wide-spaced inconspicuous teeth.

In 1939, in order to satisfy myself as to the validity of the identifications and of my own conclusions, I sent several specimens of the species to the British Museum for comparison with Walker's type. I asked Mr. W. E. China to make the comparison and send me critical notes of the results. He was very cooperative and graciously returned, in addition, careful sketches of Walker's type material. From both his statements and the sketches it is very apparent that the specimens that had in the past been considered as *Brochymena tenebrosa* Walk. by American authors do not belong to that species at all, but resemble much more the original *Brochymena obscura* (H.-S.).

Later I sent Mr. China's sketches and statements to Mr. H. G. Barber, then at the National Museum. He writes (October 30, 1939) that he is much interested in the question of synonomy and identification and is "unable to find anything in our collection which corresponds to the figures made from Walker's type by Mr. China."

Therefore I feel certain that we have before us a pentatomid of the genus *Brochymena* which has for many years been wrongly identified and that has never properly been given a name.

Since the name *obscura* is untenable and has been eliminated from use, I am therefore offering *Brochymena parva* as a new name for this species, and give below a description that should enable the student to distinguish it from other species of the genus.

Brochymena parva, n. n.

Form oval, small, with head form similar to *B. cariosa* Stål; body quite convex, apparently more so than in *cariosa* due to smaller size; ground color dark testaceous with pits, punctures, calli and markings on legs deep fuscous to piceous, giving a dark brown appearance to the individual; edges of head in front of eyes, concave, frequently sinuate with narrowest diameter about midway between eyes and subapical teeth; edges of juga straight or very weakly arcuate, converging to form a narrowly truncated apex to head; apex of each jugum acute; juga hardly longer than the tylus, if so then a very small rectangular sinus there; subapical teeth forming acute angles with juga, their tips upturned somewhat; disc of head between the eyes more convex than rest of head.

Pronotal area about the calli distinctly swollen, tumid, almost gibbose; propleuron, mesad to margin, likewise swollen, so that prothorax is very thick through the calli ventrally, almost globose; pronotal collar distinctly set off from adjacent swollen areas; marginal teeth very small, almost needle-like, sharp and very few in number, not more than four, usually two or three, wide-spaced, sometimes with minute denticles between them. [The character of the marginal teeth was for a long time used to identify *Brochymena obscura* (H.-S.).] Humeri convexly thickish, terminating laterally in an acute small tooth, this frequently directed backwards; front edge of humerus with three or four very small retrorse serrations these sometimes obsolescent; ante-humeral sinus evident with adjacent impression prominent; coarse pits of pronotum irregularly placed and no design evident; scutellum with punctures coarse and irregular in contrast with finer and very evenly crowded ones of elytra; the usual vague median impunctate line from tip of head to apex of scutellum present; base of scutellum distinctly raised, more so than in allied species but not as much as in species of the *arborea* group; sometimes base of scutellum is higher than adjacent area of pronotum and the transverse sulcus between these two is very marked; wing membrane somewhat milky with arborescent and vermiculate markings strong.

Antennae thin and weak for this genus; segment two only about one twelfth as thick as long (in *quadripustulata* this ratio is about one sixth to one eighth); other segments in proportion; segment one with a reddish tinge, others almost piceous with only the incisures of proximal two or three segments pale; segment three longer than segment two, and five shorter than four, sometimes the latter ratio very marked. Fore tibiae stubby, about one sixth as wide as long (in *quadripustulata* this ratio is about one eighth or one ninth); tibiae annulated as in related species, the dark spot in the pale annulus just about filling the width of the annulus but usually not coloring the carinate edges of the tibia; metasternal evaporating area entirely dark, only the crateriform base and orifice pale; auricle piceous, in length about twice the diameter of the orifice, thin and spatulate in outline with a partial spiral twist to it. Median third of abdominal venter pale, testaceous, almost impunctate; laterally on each segment punctures become reddish to dark fuscous and form prominent, sometimes almost piceous, lunes, similar to allied species; each lune enclosing an almost semicircular pale, nearly impunctate blotch.

Male genital cup much like that in *quadripustulata,* but its color and contents paler; posterior border as seen ventrally, broadly U-shaped, somewhat broader than in *quadripustulata* and the surface just below the middle of the U a little more impressed or concave. Apical edge of terminal female segment, as seen from above, straight to weakly sinuate, color of disc piceous except for two lateral subtriangular patches and marginal edge which are pale. This plate has some fine scattered punctures on it.

Described from twenty-five specimens as follows:

Lectotypes:

Male: 13 mm. long; 6.5 mm. across humeri; Globe, Arizona, 7/20/37. Deposited in the American Museum of Natural History.

Female: 14 mm. long; 7 mm. across humeri. Globe, Arizona, 7/20/37. Deposited in author's collection.

Paratypes:

Author's collection: Males, Santa Rita Mts., Ariz., 6/15/36; Tucson, Arizona, 8/15/05, 5/10/30, 6/25/35, 8/15/37; Wilcox, Ariz., May, 1937, Huachuca Mts., Ariz., 8/23/05.

Females: White Mts., Ariz., 7/12/36; Wilcox, Ariz., Sept., 1936; Tucson, Ariz., 8/15/37 and one labeled Arizona 1923.

American Museum Collection: Males: Concepcion Bay, Cal., 4/6–10/11; Sierrita, Ariz., 7/29/16; Van Horn, Texas, 5/22/32; Port Ballandra, Carmen Isl., Gulf of California, 5/22/21. Females: Tucson, Ariz., 10/2–25/16 (four specimens); Sonora, Mexico, 9/13/20; Tucson, Ariz., no date; (Slosson Coll.) Ac. No. 26226; Van Horn, Texas, 5/22/32; Port Ballandra, Carmen Isl., Gulf of California, 5/22/21.

Closely allied to *B. cariosa* Stål, but differs in its much smaller size, more brownish color and absence of a design. In the structure of the male parameres there is a great similarity in these species; the hook-like ramus in *B. cariosa* is small and insignificant; in *B. parva* it is the same shape but very prominent and about as long as the horizontal arm of the paramere. This species is apparently a common form in the mesquite chaparral of the southwest. It appears commonly in collections under the identification name of *B. obscura* (H.-S.) or *B. tenebrosa* (Walk.).

UNDESCRIBED SPECIES OF TIPULA FROM WESTERN NORTH AMERICA (DIPTERA, TIPULIDAE). PART II.

By Charles P. Alexander, Amherst, Mass.*

The preceding part under this general title was published in 1945 (Bull. Brooklyn Ent. Soc., XL: 33/37). At this time I am considering three further species of the genus *Tipula,* all from the desert section of western Arizona and southern California where they were collected by my friends, Messrs. George F. Knowlton and John L. Sperry, to whom I am very much indebted for many appreciated favors. The types are preserved in my personal collection of these flies.

Tipula (Lunatipula) boregoensis, n. sp.

Size very small (wing, male, 8 mm.) ; mesonotal praescutum gray, with four entire brown stripes, the intermediate pair separated by a broad gray line ; antennae with scape and pedicel yellow, flagellum black ; flagellar segments simple, without basal swellings ; femora and tibiae yellow, the tips narrowly blackened ; claws very weakly toothed ; wings with a weak brownish tinge, stigma brown ; a very conspicuous obliterative band before cord, virtually crossing the wing along vein M_4 ; male hypopygium having the posterior border of tergite very shallowly emarginate ; outer dististyle widely dilated on outer part ; inner dististyle with beak long-extended, the lower beak lacking ; a conspicuous blackened tooth on posterior portion of crest ; outer basal lobe narrowly attached to body of style, appearing as a long narrow pale blade, its apex pointed and nearly glabrous ; eighth sternite narrowed outwardly, the tip truncate, provided with two groups of relatively few long yellow setae, without lateral lobes or projections.

Male.—Length about 7 mm. ; wing 8 mm.

Frontal prolongation of head shorter than the remainder, gray above, obscure yellow on sides and beneath ; nasus stout ; palpi brownish black, the tip of the third segment narrowly paler. Antennae with scape and pedicel light yellow ; basal two flagellar segments black, simple ; remainder of organ broken but evidently short. Head light gray, still paler on front ; vertex with a very slightly darker median line that is more expanded before midlength.

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* Contribution from the Entomological Laboratory, Massachusetts State College.

Pronotal scutum gray, vaguely patterned with brown, scutellum yellow. Mesonotal praescutum gray with four entire brown stripes that are relatively inconspicuous, especially the lateral pair; intermediate stripes separated by a broad gray line that is only a little narrower than the stripe; humeral region restrictedly yellow; remainder of mesonotum gray, each scutal lobe with two brown marks; parascutella yellow; pleurotergite chiefly light yellow. Pleura light gray, the ventral sternopleurite showing a darker color beneath the pruinosity; dorsopleural region yellow. Halteres with stem obscure yellow, knob infuscated. Legs with the coxae light gray; trochanters yellow; femora and tibiae yellow, the tips narrowly but conspicuously blackened, the amount subequal on all legs; tarsi obscure yellow, passing into black; claws very weakly toothed. Wings with a weak brownish tinge, slightly darker beyond the cord; stigma brown; small dark spots at end of Sc and over the anterior cord; a very conspicuous whitish obliterative band before cord, virtually crossing the wing along vein M_4; poststigmal brightening much more restricted and inconspicuous, occupying cells Sc_2 and R_2; veins brown, paler in the areas basad of cord, especially in the prearcular and costal fields., Squamal setae conspicuous; numerous macrotrichia on most veins beyond cord. Venation: Rs more than twice as long as *m-cu*; R_{1+2} entire, its distal third without trichia; *m* and petiole of cell M_1 subequal; *m-cu* on M_{3+4} shortly before fork; basal section of M_{3+4} subequal in length to *r-m;* cell *2nd A* relatively narrow.

Abdominal tergites obscure yellow, more or less distinctly trivittate with dark brown, most evident on the outer segments, the lateral series broken into spots; central stripe more nearly continuous, interrupted by the yellow posterior borders of the segments; sternites more brownish yellow; hypopygium chiefly yellow. Male hypopygium with the ninth tergite with the posterior border very shallowly emarginate, the lateral lobes thus formed very broad; at base of notch with a microscopic lobule; ventral face of lobes with an obtuse blackened tooth directed mesad. Ninth sternite with its appendage small and inconspicuous, subcylindrical, the basal portion more dilated on the inner face, the whole appendage with numerous setae, those of the expanded portion longer and more conspicuous. Basistyle entire, its dorsal end much narrowed to pointed; caudal margin opposite the point of insertion of the dististyles with a very small sclerotized point. Outer dististyle with its outer portion broadly expanded. Inner dististyle distinctive; beak long-extended, the lower beak lacking; dorsal crest microscopically toothed, separated from a more blackened posterior lobe or crest by a U-shaped notch; the entire face of style unusually glabrous, with small and inconspicuous setae; outer basal lobe attached to body of style only by a narrow basal connection, appearing as a long narrow pale blade, its apex pointed and more nearly glabrous. Eighth sternite moderately sheathing, narrowed outwardly, the apex truncate, provided with a triangular group of about 18 to 20 long yellow setae on either side of the midline; no lateral lobes or other modifications; setae directed caudad, not or scarcely decussate.

Habitat: California.

Holotype: ♂, Borego Desert State Park, California Painted Desert, San Diego Co., altitude about 450 feet, April 23, 1944 (*J. L. Sperry*).

This very distinct fly has no very close relatives known to me. The unusually simple eighth sternite of the male, with no lateral lobes, somewhat suggests species that are allied to *Tipula* (*Lunatipula*) *usitata* Doane, which are entirely distinct flies. The species more resembles *T.* (*L.*) *buenoi* Alexander and allies which have the lateral lobes of the eighth sternite well developed.

Tipula (Lunatipula) mohavensis, n. sp.

Allied to *buenoi;* general coloration light testaceous brown, more or less pruinose; pleura patterned with brown and yellow; antennae with basal three segments yellow, flagellum black; wings with a strong brownish gray tinge, the prearcular and coastal regions even darker brownish yellow; stigma pale brown, small; obliterative areas very reduced; veins delicate; male hypopygium with the tergite large, its caudal border produced into four blackened points, the outer pair appearing as spines, the shorter inner pair more obtuse; outer dististyle conspicuously expanded at apex; inner dististyle with the beak massive, heavily blackened; dorsal crest produced backward into a conspicuous blade; outer basal lobe a large flattened plate with all margins obtuse; eighth sternite with the lateral and median lobes detached from the body of the sclerite by pale membrane; lateral lobes two-armed, the outer one a glabrous sclerotized horn, the inner arm with several strong setae on its basal part; median lobe transverse, with two large groups of long crinkly setae.

Male.—Length about 15 mm.; wing 15.5 mm.; antenna about 4.7 mm.

Frontal prolongation of head obscure orange yellow; nasus distinct; palpi light brown or brownish yellow. Antennae with scape, pedicel and most of first flagellar segment yellow, the outer end of the latter more darkened; remainder of flagellum black, the segments moderately incised. Head obscure yellow, discolored; vertical tubercle very low to scarcely evident.

Pronotal scutum brown, more or less darkened medially; scutellum and adjoining regions of praescutum bright yellow. Mesonotum discolored, evidently light testaceous brown, more or less pruinose, the praescutum apparently with stripes. Pleura chiefly brown, pruinose; dorsopleural region and extensive areas on the pleurotergite and posterior pleurites bright yellow, including a very narrow transverse line extending from the propleura to behind the fore coxa. Halteres with stem obscure yellow, knob darkened on basal portion, the apex obscure yellow. Legs with the coxae obscure brownish yellow, gray pruinose; trochanters yellow; remainder of legs broken. Wings with a strong brownish gray tinge, the prearcular and costal regions even darker brownish yellow; stigma pale brown, small; obliterative areas very reduced, only the prestigmal one present, extending from before the stigma along the cord, barely entering cell M_3; veins light brown, more yellowish brown in the saturated portions. Squamal setae strong and conspicuous; trichia of veins beyond cord numerous and well distributed, lacking on distal third of R_{1+2}; veins more delicate than in *buenoi.* Venation: *Rs* about twice *m-cu;* R_{1+2} entire; petiole of cell M_1 nearly twice *m; m-cu* on M_4 immediately beyond origin.

Abdominal tergites chiefly fulvous yellow, the posterior margins narrowly, the lateral borders more broadly grayish yellow; sternites and hypopygium yellow. Male hypopygium with the ninth tergite large, its caudal border produced into four blackened points, the outermost pair appearing as strong blackened spines, the inner pair as somewhat shorter blackened knobs, the various points spaced about equidistantly from one another; a conspicuous dorsal furrow. Ninth sternite with its appendage small and inconspicuous, provided with long pale setae. From the notch of the sternite, visible in profile, juts a small sclerotized structure that terminates in two divergent spinous points. Basistyle entire, its dorsal portion produced into a slender arm; caudal margin unmodified. Outer dististyle expanded at apex into a flattened oblique head. Inner dististyle with its beak massive, heavily blackened; lower beak much smaller, likewise heavily blackened; dorsal crest produced caudad into a conspicuous blade; outer basal lobe a large flattened plate, in the type slide bent backward over the body of the style and its exact outlines difficult to delimit but the margins evidently all obtuse; basal portion of lobe with an extensive group of long yellow setae; sensory area long-oval, including about ten facets. Phallosome consisting of two united plates, each with a strong recurved reddish spine and a longer, more nearly straight outer blade. Eighth sternite with three isolated lobes, detached from the main body of the sclerite by pale membrane; lateral lobes two-armed, the outer arm a glabrous sclerotized horn, the inner one with several strong setae on its basal portion; median lobe pale, its cephalic margin transverse and more thickened, on either side with large groups of setae that bend toward the midline but are scarcely decussate, these setae conspicuously fimbriate and tangled at their tips.

Habitat: Arizona.

Holotype: ♂, Kingman, Mohave Co., altitude 3340 ft., May 9, 1945 (*G. F. Knowlton*).

The most similar described species include *Tipula* (*Lunatipula*) *buenoi* Alexander and *T.* (*L.*) *stalagmites* Alexander, which differ very evidently in all details of structure of the male hypopygium.

Tipula (Lunatipula) macracantha, n. sp.

Belongs to the *impudica* group; general coloration of mesonotum gray, including the praescutal stripes, the median stripe with brown borders; antennae with scape and pedicel yellow, flagellum brownish black; flagellar segments strongly incised; legs brown, tarsi blackened; wings rather conspicuously patterned with brownish gray and whitish subhyaline, the latter color including a major prestigmal area that reaches the wing tip in cell R_5; abdominal tergites yellow with three dark brown stripes, the lateral pair much broken, virtually restricted to linear dashes near the bases of the intermediate tergites; male hypopygium with the tergal canthi appearing as long triangular blades, the tips acute; median lobe conspicuous, compressed along upper margin; lateral processes appearing as small, very acute spinous points; outer dististyle with apex very expanded, roughly triangular in outline; inner dististyle with both the beak and lower beak heavily blackened, posterior crest small, outer basal lobe short and stout, its apex truncate; eighth sternite with a small dark-colored lobule in the membrane of the following sternite.

Male.—Length about 15 mm.; wing 13.5 mm.; antenna about 4.8 mm.

Frontal prolongation of head brown, pruinose; nasus very small; palpi brownish black. Antennae (male) moderately long; scape and pedicel yellow, flagellum brownish black; flagellar segments with the basal swellings a trifle more intensely colored than the stems, strongly incised; longest verticils subequal in length to the segments. Head light gray, with a narrow but conspicuous black median vitta extending from the low vertical tubercle onto the occiput.

Pronotal scutum brown, darker on lateral parts; scutellum light yellow. Mesonotal praescutum with the interspaces buffy, the stripes and lateral borders light gray, the latter more yellowed on the humeral region; median stripe with conspicuous brown borders that do not quite reach the suture; lateral stripes narrow, dark brown, only a little wider than the dark margins of the central stripe; scutum gray, each lobe weakly patterned with brown, median area more yellowed; posterior sclerites of notum obscure yellow, gray pruinose, with a continuous dark brown median line. Pleura light brown, gray pruinose, vaguely patterned with brown. Halteres with stem testaceous, yellow at base, knob infuscated, restrictedly more brightened on dorsal edge. Legs with the coxae obscure yellow, sparsely pruinose; trochanters yellow; remainder of legs brown, the tarsi passing into black; claws (male) toothed. Wings rather conspicuously patterned with brownish gray and whitish subhyaline, the latter color including the prearcular field and basal cells; a major prestigmal area, continued to the wing tip in cell R_5; poststigmal brightening more restricted; other pale areas in outer end of cell R_3, most of M_1, bases of *2nd* M_2, M_3 and M_4, and as conspicuous borders to both Anal veins, leaving conspicuous marginal darkenings in the centers of the Anal cells; cells C and Sc a trifle more yellowed than the remainder of ground; somewhat darker clouds in cells R_2 and R_3 and again in the outer end of cell M at *m-cu;* veins brown, paler in the prearcular and costal fields. Venation: Rs relatively long, about two and one-half times *m-cu;* R_{1+2} entire; *m* longer than petiole of cell M_1.

Abdominal tergites yellow, with three dark brown stripes, the median one more nearly entire, interrupted at the incisures, particularly at the posterior borders of the segments; lateral stripes much interrupted, appearing as a linear spot near the base of tergites three to seven, less evidently on tergite two; lateral tergal borders broadly grayish yellow; sternites yellow, the outer segments more patterned, especially medially on sternites seven and eight; hypopygium yellow. Male hypopygium having the ninth tergite with the canthi unusually elongate, appearing as long-triangular curved blades that narrow to acute points; setae of margin very small and inconspicuous, those of the basal and lateral portions long and stout; median lobe (subtergal process) only a little shorter than the canthi, the dorsal edge compressed-flattened, the lower portion more expanded; lateral processes appearing as small, very acute spinous points. Ninth sternite having the margin provided with coarse setae, those nearest the midline arising from conspicuous basal tubercles; lobe of sternite small, suboval, with a smaller lateral lobule or flange, the main body of the lobe provided with coarse yellow setae. Basistyle with its dorsal part narrowed into a slightly sclerotized spinous point, the ventral end also narrowed but more obtuse. Outer dististyle with the outer end very expanded, roughly triangular in outline; setae elongate, restricted to outer half. Inner dististyle with both the beak and lower beak heavily blackened, the latter very stout; posterior crest small, its dorsal margin microscopically toothed; outer basal lobe short and stout, its apex truncated, on the proximal portion with the usual area of delicate appressed setae; sensory area comprised of only about 8 or 9 facets. Eighth sternite with a small dark-colored median lobule in the membrane of the following sternite, this smaller than the corresponding structure in *mitrata,* provided with microscopic scabrous points; central portion of sternite with several rows of long setae, the lateral parts produced into low lobes that are provided with a few still longer bristles.

Habitat: Arizona.

Holotype: ♂, Peach Springs, Mohave Co., altitude 4790 ft., May 8, 1945 (*G. F. Knowlton*).

The only species of the *impudica* group with which the present fly requires comparison are *Tipula* (*Lunatipula*) *mitrata* Dietz and *T.* (*L.*) *utahicola* Alexander, both of which differ conspicuously in the details of structure of the male hypopygium, particularly of the tergite and dististyles.

RECORDS AND DESCRIPTIONS OF MISCELLANEOUS CUBAN HEMIPTERA.

By H. G. Barber, Roselle, N. J., and S. C. Bruner,
Santiago de las Vegas, Cuba.

The following new information on the Hemiptera of Cuba has accumulated in the past few years.

The types of species described here-in will be deposited in the U. S. National Museum and paratypes retained in the collections of the authors.

Cydnidae.

Cyrtomenus mirabilis (Perty)

One specimen from the town of Pinar del Río in western Cuba collected June 20, 1944, at light, by Dr. J. T. Roig constitutes the first record of the occurrence of this genus on the Island or in fact, so far as we know, at any locality in the West Indies.

Pentatomidae.

Murgantia violascens (Westw.)

We have examined two examples of this species from Cuba, both taken in the eastern Province of Oriente: one collected near the coast south of Turquino Peak, elevation about 1000 feet, by J. Acuña, June 20, 1936, and the other from near the town of Holguín, R. G. Castañeda, collector. These measured only 7.2 mm. in length. Originally described from Jamaica, it has also been taken on two of the Florida Keys, but not heretofore recorded from Cuba. It is not represented in the Gundlach collection in Havana.

Acrosternum marginale Herrich-Schaeffer

1836. *Pentatoma marginale* Herrich-Schaeffer, Wanz. Ins. III: 95, Fig. 320.
1837. *Pentatoma nitida* Westwood, Hope Cat. II: 33.
1845. *Raphigaster marginalis* Herrich-Schaeffer, loc. cit. VIII: 6.
1867. *Strachia olivacea* Walker, Cat. Het. II: 322. (teste Distant)
1872. *Nezara marginalis* Stål, Enum. Hem. II: 40.
1892. *Nezara marginalis* Berg, Nova Hem. Arg. Uruguay, 36.

In 1932[1] we reported this species from Cuba as *Nezara nitida*

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[1] Barber, H. G., and Bruner, S. C., 1932. The Cydnidae and Pentatomidae of Cuba. Jour. Dept. Agr. Puerto Rico, XVI: 262.

Westwood from a single faded specimen labeled *Nezara marginale* Herrich-Schaeffer contained in the Gundlach collection at Havana. As remarked it was impossible to make a close study of it but a brief description was given. As this species had not been recorded from the West Indies we had some doubt at the time as to its occurrence in Cuba. More recently this determination as Herrich-Schaeffer's species has been confirmed by the taking of several specimens on the island feeding on an exotic species of *Ixora,* as follows: Central Soledad, Cienfuegos, Las Villas Province, July 20, 1939 and Moa, Oriente Province, Nov. 15, 1945 (J. Acuña Coll.).

We find that the name *Nezara marginale* H.S. was published previously by P. Valdés[2] with the observation "15 mm., color verdoso." Although we have approved of this determination we would feel on safer grounds if it were possible to secure material from South America for comparison.

Apparently Kirkaldy[3] was in error in rejecting Herrich-Schaeffer's name in favor of Westwood's.

Podisus jole Stål

There are three examples of this Mexican species, a male and two females, from Las Martinas, Pinar del Río Province, taken June 24, 1940, by J. Acuña. They measure 10.0–10.5 mm. in length and are rather pinkish testaceous in color including the antennae, although these are somewhat embrowned distally. The humeral angle of pronotum is subacute and black, the pale anterior lateral margin entirely straight and even. The outer apical angle of corium is broadly pink and the membrane slightly infuscate; in one specimen there is a short, indefinite, dark vitta at the apex. The insect is coarsely punctate above, the pronotum being more sparsely punctate anteriorly, the surface rather glossy; below sparsely and shallowly punctate. The connexivum is somewhat narrowly exposed, flavescent, and appears slightly serrate, particularly in the female, due to the projecting, sharp apical angles of the segments. Below largely testaceous, more or less pinkish; legs immaculate. Venter paler covered with five rows of somewhat darker, irregular maculae; ventral spine long, reaching middle of mesocoxae.

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[2] Valdés R., Pedro. 1910. Clasificación Gundlach de los Hemípteros Cubanos. An. Acad. Cien. Med., Fis. y Nat. Habana, XLVI, pp. 425–446.

[3] Kirkaldy, G. W. 1909. Cat. Hem. Cim.: 116.

With this form, six species of the genus are now known to occur in Cuba.

COREIDAE.

Phthia splendida Valdés

1910. Valdés R., Dr. Pedro. Classificación Gundlach de los Hemípteros Cubanos. An. Acad. Cien. Med., Fis. y Nat. Habana, XLVI: 431.

Form rather broad, robust, in part somewhat lustrous. Head much less than half as wide as the pronotum posteriorly. Basal segment of antenna but little if any longer than head, steel-blue. Rostrum extended to middle of the second visible ventral segment of abdomen. Pronotum distinctly pilose, very finely and closely punctate; behind the anterior depressed collar with a median pair of small, blunt papillary-like processes; humeral angle produced into an acute, dark spine directed slightly upward and forward; lateral margin with a widely spaced row of very distinct, irregular, obtuse teeth; two or three very small post-humeral teeth. Scutellum about as wide as long, transversely strigate. Clavus rather coarsely and closely punctate. Corium more closely and finely punctate. Connexivum narrowly exposed. Legs relatively short; posterior femur of male somewhat incrassate, armed below with three or four preapical, short, flattened, acute, recurved spines and above with several slight preapical tubercles.

Color steel-blue, somewhat lustrous. Head above with three narrow longitudinal orange-red fasciae, median one abbreviated and one on each side extended from the inner margin of the eye to base of head. Pronotum steel-blue anteriorly and posteriorly and along the lateral margin anteriorly, including the marginal teeth; disk with a broad, transverse, orange-red area extended to the humeral angle on each side, interrupted anteriorly by an abbreviated longitudinal streak; often with a few rounded spots anteriorly. Scutellum and corium steel-blue the latter with a broad, transverse, irregularly margined orange-red band just posterior to the middle. Connexival segments with alternating orange-red and black fasciae, the latter occupying somewhat less than half of the segment. Beneath with head, pleura and venter orange-red; each pleurite with a broad, steel-blue fascia extended obliquely forward from the coxae. Venter with a rather large rounded spot on each segment between the line of spiracles and middle line of venter; marginal spots of the connexivum correspond with those of the dorsum. Legs steel-blue, lustrous. Length of male 16, female 18 mm.

Lectotype male: Moa, Oriente Province, Nov. 3–16, 1945. Eighteen paratypes and one nymph collected on *Taonabo parviflora* Kr. and Urb. by J. Acuña.

Fifth Instar Nymph.

Shining steel-blue above with the disk of the thorax in large part and most of the abdomen dull orange. It differs from the adult particularly in having two slender, erect, spine-like processes on the head in front of the eyes and a similar but longer, more approximate pair near the anterior margin of the pronotum. The first five connexival segments each has a short, erect, steel-blue, thumb-like projection on the margin and the disk of the abdomen is provided with a low, rounded, steel-blue tubercle and a small one behind this. All parts of the body including the structures referred to are provided with distinct and rather dense pilosity, while the adults are more sparsely pilose.

This very rare and apparently endemic species is represented by a single example in the Gundlach Museum in Havana said to have been taken at Guanabacoa near Havana. It is labeled *Phthia splendida* Uhler MS, a name supplied by Dr. Uhler in 1883 but never published by him. However it was published in 1910 by Dr. P. Valdés R. with the following very brief description: "12 mm. (length) *obscura fajas transversales pardas.* No. 431".

Cydamus borealis Distant

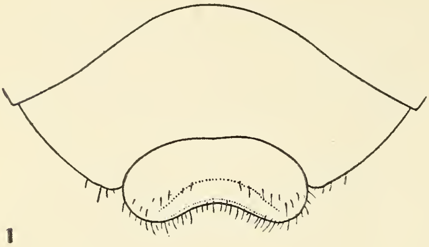
A single specimen of this species, described from Guatemala, was taken at Camagüey, Cuba, on August 10, 1927 by J. Acuña.

REDUVIIDAE.

Ctenotrachelus shermani Barber

1910. Barber, Entom. Amer. X (N.S.): 185.

A single specimen of what we have been unable to separate from *C. shermani* was collected by J. Acuña at Moa, Oriente Province, Nov. 3–16, 1945. It is a male 11 mm. long while the type female from North Carolina measured 14 mm. Except for the discrepancy in size it agrees in structure and color pattern with other specimens from the United States. This species must have a rather wide range as it has been taken at Hope, Ark., and Jackson, Miss. All specimens from the United States hitherto seen have been females.



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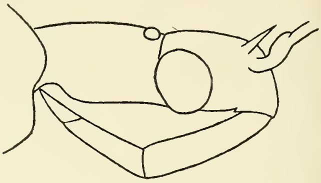

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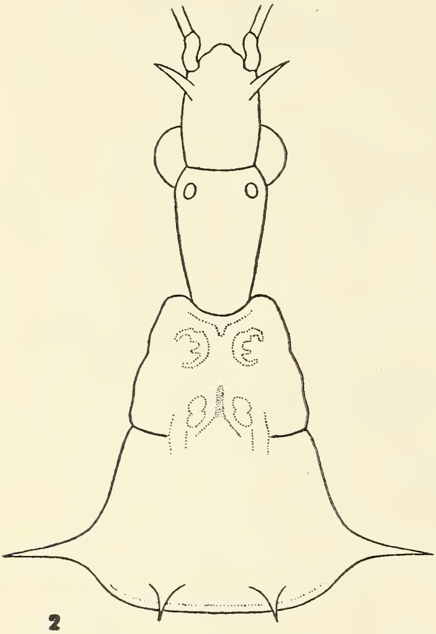

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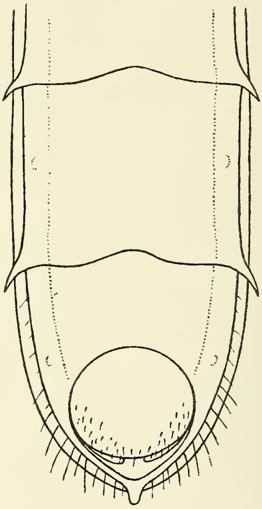

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FIG. 1. Male hypopygium of *Acrosternum marginale* H.-S. FIG. 2. *Doldina cubana,* n. sp. Head and thorax. FIG. 3. Lateral view of head of same. The hairs have been omitted in this and the foregoing. FIG. 4. Apical half of venter of *Doldina cubana,* n. sp.

Doldina cubana, n. sp. (Figs. 2, 3 and 4)

A moderately slender, dull reddish brown species, rather distinctly hirsute, the posterior lobe of the pronotum armed behind with four, strong, acute spines and the apical angle of the first five connexival segments with an acute spine.

Form rather slender (7 × 1) with long, thin legs and antennae. Head distinctly shorter than pronotum (26 : 31) and a little more than twice as long as wide across eyes, straight with sides sub-parallel in lateral view, suddenly coarctate at base, the constriction more pronounced below; anterior lobe slightly shorter than posterior lobe; eyes moderately prominent; ocelli large (nearly 0.2 mm. in diameter), well separated, almost as far apart as eyes, not distinctly elevated; post antennal spines nearly as long as vertical diameter of eyes; antenna normal, basal segment not quite as long as head and pronotum together, relative length of segments 37 : 10 : 28, apical segment missing; rostrum moderately curved, bent at joint between two basal segments; segment 1 slightly longer than 2 and 3 together. Pronotum distinctly longer than wide (31 : 24), flattened above, feebly declivent cephalad; anterior lobe unarmed, concave in front above, sculptured, anterior lateral angle prominent, rounded, disc behind with a short, median sulcus from transverse groove, the latter narrow and shallow; posterior lobe with surface minutely and shallowly punctate, the surface otherwise relative even, the four strong, acute spines behind smooth, a low, short, obtuse ridge running forward from before disc to anterior lobe either side of median depression and there obsolete, posterior margin truncate. Scutellum longer than wide (25 : 19), an elevated Y above, apex narrow but somewhat swollen. Legs slender, the anterior femur slightly stouter, apices of all femora with a small, acute spine on either side; the anterior tibia with a laterally flattened tooth above near apex. Abdomen narrow, not exceeding humeri in width, parallel-sided; connexivum not exposed, apical angles of first five visible segments with a very acute spine, directed obliquely backward and upward, largely visible from above; pygidium produced into a short, obtuse point; the claspers contained in genital capsule, the hind margin of latter broadly rounded. Length 15.5 mm., width 2.2 mm.

Dull reddish brown, nearly uniform, somewhat thinly covered with adpressed, whitish pubescence and long, pale, pilosity, more conspicuous on posterior lobe of head, legs, and apex of abdomen; eyes dark; ocelli crystalline; membrane brownish with concolorus veins; legs reddish.

Holotype: Male, from near Veguita, Oriente Province, Cuba, collected August 27, 1942, by J. Acuña.

This species is less elongate than the North American *Doldina* *interjungens* Bergroth which in the male is at least eight times as long as broad. The thorax of the present form is also less cylindrical, being relatively narrower and more declivent cephalad. The spines are also much stronger than appears to be usual in this genus. It is, in fact, somewhat intermediate in several respects between *Doldina* and *Ricolla,* the latter common in the tropics of continental America. However, the structure of the head and more elongate form indicate that it should be referred to the former genus.

Doldina cubana seems rather similar to *D. bicarinata* Stål of Brazil, but has a spine on the posterior apical angles of only the first five connexival segments and the first joint of the antenna is relatively shorter. As in that species the posterior lobe of the pronotum is armed behind with four long spines. The color differs in being reddish brown rather than sordid flavescent, but this is no doubt variable. It appears also to be related to *D. antiquensis* Barber (1923) ; however, the latter has only the first three abdominal segments armed with spines, aside from other differences.

MIRIDAE: PHILINAE.

Campylomma cardini, n. sp. (Fig. 5)

Rather broadly oval with a short rostrum, entirely pale and nearly concolorous above, minutely and inconspicuously pubescent, appearing practically bare at ordinary magnifications.

MALE.—Head width 0.66 mm., vertex 0.30 mm., length 0.19 mm. Rostrum short, reaching to middle of anterior coxae, apex embrowned, joint 2 longest. Antennae as long as head, pronotum, scutellum, and nearly reaching tip of clavus; first segment, length 0.19 mm.; second 0.66 mm.; third 0.42 mm.; fourth 0.26 mm.; clothed with minute pubescence, the thickened basal segment with a few short hairs also.

Pronotum, length 0.47 mm., width at base 0.87 mm. Above with pronotum and hemelytra finely punctate, rather thinly and finely pubescent, many punctures with a minute hair, more noticeable on hemelytra; also a few longer hairs around edges. Legs minutely pubescent, the tibiae armed with rows of spines. Genital segment somewhat asymmetrical, a stout chitinous spine projecting from above near the apex, directed obliquely to the left.

Pale greenish testaceous above with blackish eyes, fading in dried specimens to light testaceous. Antennae, head, mesoscutum, and scutellum more yellowish. Hemelytra translucent; cuneus and corium concolorous; membrane slightly

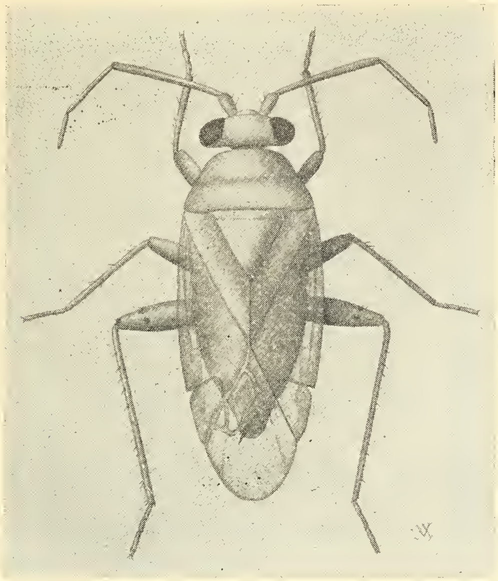

Fig. 5. *Campylomma cardini,* n. sp.

infuscate, nearly hyaline. Body below similar but abdomen yellowish green; legs pale flavescent, the posterior femur with about five rather large, rounded, black spots on apical half, unequal in size; intermediate femur usually with one or two similar spots; spines on tibia dark, hind tibia with a row of minute black dots.

Length 2.50 mm. (2.25–2.54 mm.), width 0.90 mm. (hemelytra).

Female.—Similar in coloration and general appearance to male except that the antennae are relatively shorter and abdomen is broader and usually more distinctly green. Head width 0.65 mm., vertex 0.36. Antennae, first segment, length 0.19 mm.; second 0.50 mm.; third 0.35 mm.; fourth 0.26 mm. Pronotum, width at base 0.85 mm.

Length 2.44 mm. (2.35–2.63 mm.), width 0.94 mm. (hemelytra).

Host Plant.—The exotic "Oreja de judío" or Guanacaste Earpod Tree, *Enterolobium cyclocarpum* (Jacq.) Gris. of the family *Mimosaceae,* native to other countries of tropical America.

Holotype: Male, Santiago de las Vegas, Havana, Cuba, July 4, 1945, S. C. Bruner. *Allotype:* Female, same data. *Paratypes:* 1 male, Calabazar, Aug. 5, 1928, S. C. Bruner; 1 male, Arroyo Naranjo, Sept. 14, 1936, L. C. Scaramuzza; 5 males and 1 female, Santiago de las Vegas, July 19, 1944, S. C. Bruner; 19 males and 12 females, July 4, 1945, same locality and collector.

This insect is at present known to occur only in Havana and Matanzas Provinces, Cuba, where it is a pest of the shade tree mentioned, seen along some of the older highways. Indications of infestations are noted as early as June, the foliage on certain trees gradually turning pale yellow due to a constantly increasing number of yellow dots on the upper surface. The leaflets later fall, so that by early autumn all of the trees of this species in a district may be largely or entirely defoliated.

The species is distinguished from the introduced European *C. verbasci* (Meyer), the only other member of the genus known to occur in America, by the absence of dark markings on the tylus and two basal segments of the antennae, the concolorous hemelytra, and the pale color of the body below, without appreciable pubescence.

It was first studied in Cuba by the late P. Cardín (*Psallus* sp., Third Annual Report, Est. Exp. Agr., Cuba, p. 152, 1915). In 1936 Dr. H. H. Knight determined specimens for the junior author as *Campylomma,* n. sp., but has been unable to give it further attention. The genus is common in the Old World and Oshanin (1912) lists ten species known in Europe, Asia, and Africa; recently it has been found to be widespread in Oceania. An even larger number has been discovered there by Knight and Usinger, these occurring in the Marquesas, Samoa, Tahiti, the Philippines, Guam, and Hawaii. It is not entirely unlikely that the present form will eventually prove to be introduced.

GELASTOCORIDAE.

Gelastocoris oculatus (F.)

We have five specimens of this widespread form from Pinar del Río Province, four collected by J. P. Carabia, Jan. 11 ,1937, at Puerto de Golpe and one taken at Las Martinas, June 24, 1940, by J. Acuña, both localities in extreme western Cuba. The genus is rare or very local in this country; it is not represented in the collection of Gundlach in Havana nor is it listed among the insects obtained by him from the Island (MS). However, Uhler[4] under

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[4] Uhler, P. R. 1876. List of the Hemiptera . . . etc. Bull. U. S. Geol. Geog. Surv., Vol. 1, Ser. 2, No. 5, page 336.

Galgulus variegatus Guer. says: "Inhabits . . . Cuba," in addition to various localities in continental North America. This record has been repeated by Champion in the "Biologia," page 349, and by others, but there appear to be no recent reports of its occurrence anywhere in the West Indies. It seems probable that Uhler's Cuban record really referred to *G. oculatus* as there has been considerable confusion in the past regarding the species in this genus.

Chermidae Notes.—The following records of Chermidae are are for material recently identified by Miss Louise M. Russell of the U. S. Bureau of Entomology and Plant Quarantine:

Chermidae, Cherminae:

Chermes cooleyi Gillette, from Canadian spruce, Logan, Utah, May 2 and 5, 1928; white spruce, Logan, July 22, 1929, at which time they were abundant; on *Picea engelmanni* at Big Cottonwood Canyon, Utah, June 29, 1925, and Logan Canyon, June 23 and August 28, 1925; on Colorado blue spruce, Cedar Canyon, Utah, July 8, 1925. Specimens, apparently *C. cooleyi,* were taken on Douglas fir at Logan Canyon, Utah, June 23, 1925, and at Kaibab Forest, Arizona, July 12, 1925; on white balsam, Spring Hollow, Logan Canyon, Utah, August 28, 1925; pine, Emigration Canyon, Utah, June 21, 1925; Cedar Canyon, Utah, July 8, 1925 (Knowlton).

Pineus coloradensis (Gillette) on western yellow pine, Kaibab Forest, Arizona, July 12, 1925 (Knowlton).

P. pinifoliae (Fitch) on *Picea engelmanni,* Gallatin County, Montana, June 28, 1940 (Knowlton).

P. similis (Gillette) on *Pinus flexilis,* Pingree Park, Colorado, August 21, 1935; on conifer, Mink Creek Canyon, Idaho, June 24, 1925; on Colorado blue spruce, Kaibab Forest, Arizona, July 12, 1925; and at Cedar Canyon, Utah, July 8, 1925 (Knowlton).

Chermidae, Phylloxerinae:

Phylloxera sp. on wild grape, Zion National Park, Utah, July 10, 1925 (Knowlton).—George F. Knowlton, Utah State Agricultural College, Logan.

BOOK NOTES.

Catálogo de los Insectos que Atacan a las Plantas Económicas de Cuba, por S. C. Bruner, L. C. Scaramuzza y A. R. Otero. 1945. Boletín No. 63, Estación Experimental Agronómica, Santiago de las Vegas, Provincia de la Habana. Pp. 1–246, plates I–XII.

This, as the title sets forth, is a catalogue of the insects that attack economic plants in Cuba. The arrangement is strictly according to the plants attacked, in alphabetic order of the generic botanical names. The vernacular local names of the plants are given in Spanish and in English, where there are the latter. Its use is facilitated by the Index, which is arranged taxonomically by Orders in sequence in their linear place, the genera within the Orders being alphabetically given. There are also separate indices of the common names of plants and of predators. Since so many of the plants are also found in the United States, and Florida is so close to Cuba, the work is of interest and value in this country also. The 12 plates of insects are excellent and well printed, and are either from drawings or enlarged from photographs.

Entomological Nomenclature and Literature, by W. J. Chamberlin. 1946. Pp. i–viii + 1–135, with two portraits. Edwards Brothers, Inc., Ann Arbor, Mich. (Cloth bound, $3.25; pressboard, $2.75.)

This, the second edition of this highly useful compendium, is not a mere second printing but a revision with much added.

Part I discusses nomenclature, its object and importance. Of particular value is the commentary on what constitutes a species, with remarks on sub- (or less) forms, essaying to delimit their function in taxonomy and in nomenclature. The International Code of Nomenclature is given, as well as the Opinions under it. Two bibliographies close this part, one on papers on nomenclature, the other on the designations of types.

Part II, on Entomological Literature, is definitely bibliographical, with citation of non-entomological journals which publish on insects.

Part III, on Scientific Publication, is new. It includes a history of typography and a glossary of printing terms, together with extensive directions and suggestions on the preparation of scientific articles. Sixty years ago, this reviewer was doing newspaper work. The walls of the reporters' room were adorned with large placards, which epitomized the art of writing for the press. There were two of these placards in oversize type, all over the walls. One read: "Have something to say. Say it. Stop!" The other had but two words, repeated: *"Be brief!* Be brief! BE BRIEF!"

Dr. Chamberlin might have added with profit to this Part words to the effect that an author has NO control over the style or size of type in which his article is to appear; nor over the arrangement of matter on the page. These two are permanently set by the controlling organization of any publication, after due deliberation. The editor's sole function is to put into effect the principles as laid down for him.

The writer has read with great pleasure the brief biographies of the founders of entomology, reserving the more technical matter for reference, which is its purpose.

An Annotated List of the Scolytoidea of Washington, by Gordon K. Patterson and Melville H. Hatch. University of Washington Publications in Biology, vol. 10, no. 4, pp. 145/156. (1945. Price 20 cents.)

As its title indicates, this is an annotated faunal list of bark beetles thus far recognized as inhabitants of the State of Washington.

J. R. T.-B.

Very Special Notice to Authors—This Bulletin adheres strictly to spellings of terms as given in "A Glossary of Entomology." We have drawn attention to this before. It is mentioned again for emphasis.

Authors likewise are asked NOT to mark their MSS for style of type or for arrangement of page. Both these elements are standardized for each of our publications, the Bulletin and Entomologica Americana. Our editorial policy is to adhere strictly to our style as established.

J. R. de la Torre-Bueno, *Editor,*
Brooklyn Entomological Society.

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This page is limited to exchange notices and to small For Sale advertisements from members of the Society and from actual paid subscribers to the Bulletin exclusively. *Exchange notices* from members of the Society and from subscribers are limited to *three (3) lines each,* including address; beyond 3 lines, there will be a charge of $1.00 for each 3 lines or less additional. *For Sale* ads will be charged at $1.25 for each 3 lines or part of 3 lines. *Commercial or business* advertisements will not be carried in this page, but will go in our regular advertising pages at our regular advertising rates to *everybody.*

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Vol. XLI JUNE, 1946 No. 3

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BULLETIN
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BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XLI June, 1946 No. 3

UNDESCRIBED SPECIES OF TIPULA FROM WESTERN NORTH AMERICA (DIPTERA, TIPULIDAE). PART III.

By Charles P. Alexander, Amherst, Mass.

The preceding part under this general title was published in 1946 (Bull. Brooklyn Ent. Soc., XLI: 45). At this time I am describing three further species of *Tipula,* chiefly based on the materials contained in the great Melander Collection. As before, my deep thanks are extended to Dr. Melander for the opportunity and privilege of naming these flies and for his kindness in permitting me to retain the type of one of the species that is represented by a single specimen.

Tipula (Oreomyza) yellowstonensis, n. sp.

Belongs to the *borealis* or *unca* group; size unusually small (wing, male, 11 mm. or less); mesonotal praescutum gray with three darker gray stripes that are bordered by brown; femora brownish yellow, the tips narrowly brownish black; claws (male) toothed; wings pale brown and yellowish subhyaline, the pattern relatively ill-defined; abdominal tergites obscure yellow, trivittate with brown; male hypopygium with the beak of the inner dististyle short but slender, sloping directly into the long crest that is fringed with delicate setae; lateral appendage with two processes, the lower a long slender curved spine; gonapophysis with its apex obtusely rounded; eighth sternite weakly trilobed, the setae short and abundant.

Male.—Length about 10–11 mm.; wing 10.5–11 mm.; antenna about 4–4.4 mm.

Female.—Length about 13.5 mm.; wing 12 mm.

Frontal prolongation of head light brown, slightly darker above, including the long nasus; palpi dark brown. Antennae (male) relatively long; scape and pedicel yellow, flagellum

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black; flagellar segments long, only feebly incised. Front and anterior vertex light yellow; posterior portion of head light gray, with a median brown stripe.

Pronotal scutum gray, variegated with brownish gray; scutellum and pretergites yellow. Mesonotal praescutum with the ground color gray, with three darker gray stripes that are narrowly bordered by brown, the broad median stripe on cephalic third enclosing two similar brown lines, these more or less connected with the outer borders behind; posterior sclerites of notum gray, variegated with darker brownish gray, including two areas on each scutal lobe; central area of scutellum and mediotergite narrowly infuscated; pleurotergite yellow. Pleura with the mesepisternum gray, vaguely patterned with darker brownish gray; mesepimeron and metapleura more uniformly yellowed. Halteres brown, the base of stem restrictedly yellow, apex of knob vaguely pale. Legs with the coxae yellow, sparsely pruinose; trochanters yellow; femora and tibiae brownish yellow, the tips narrowly brownish black; tarsi black, the proximal portions of the basitarsi paler; claws (male) toothed. Wings pale brown and yellowish subhyaline, the pattern relatively indistinct; prearcular field and costal region more saturated yellow; stigma and a small spot over origin of *Rs* somewhat darker brown; the pale areas are best developed as a band beyond the stigma, extending backward to vein M_{1+2}, more or less connected with a similar area centering at cell *1st* M_2; another large pale spot before outer end of cell *M* and including the adjoining cells; other areas still more basad in cells *Cu* and *1st A;* veins brown, more yellowed in the saturated portions. Venation: *Rs* about twice *m-cu.*

Basal abdominal tergites chiefly gray; succeeding tergites grayish brown medially, obscure yellow sublaterally, with conspicuous broken darker brown sublateral stripes; lateral margins broadly, posterior borders more narrowly pale yellow; outer segments, including most of hypopygium, dark brown; median dark tergal stripe narrowed posteriorly and becoming obsolete beyond the sixth segment; basal sternites yellow, the outer ones slightly darker. Ovipositor with the cerci long and slender, virtually straight, considerably exceeding the compressed-flattened hypovalvae. Male hypopygium having the ninth tergite with its apical portion broadly sessile, the lateral angles produced laterad into long slender blackened points. Outer dististyle broad, its apex very obtuse. Inner dististyle with the beak short but slender, sloping gradually upward into the dorsal crest, the latter with a long row of setae. Lateral appendage with two processes, the upper a pale, nearly parallel-sided blade, the lower one a long slender curved spine. Gonapophysis slender, strongly bent on proximal half, the apex narrowly obtuse. Eighth sternite weakly trilobed, the setae abundant but short.

HABITAT: Wyoming, Utah.

HOLOTYPE: ♂, Yellowstone National Park, Wyoming, south entrance, July 24, 1934 (*Melander*); in Melander Collection. *Allotopotype,* ♀. *Paratopotypes,* 6 ♂♂; *paratype,* ♂, Spanish Fork, Utah Co., Utah, altitude 4550 feet (*D. Elmo Hardy*).

This fly is most similar to the eastern North American *Tipula* (*Oreomyza*) *grata* Loew, differing in the very small size, details of coloration and, especially, the structure of the male hypopygium, including the tergite, inner dististyle, gonapophyses and eighth sternite. The species is less like *T.* (*O.*) *ingrata* Dietz and *T.* (*O.*) *rohweri* Doane, which have the lateral appendage of the hypopygium somewhat the same.

Tipula (Arctotipula) loganensis, n. sp.

General coloration gray; praescutum light gray with four very slightly differentiated darker brownish gray stripes that are narrowly bordered by blackish, most intensely so as a median vitta separating the intermediate stripes; antennae short, the basal swellings of the flagellar segments very poorly developed; legs dark brown, the femoral bases restrictedly obscure yellow; claws (male) toothed; wings grayish subhyaline, variegated with pale brown, appearing as a seam over cord and at wing tip; stigma somewhat darker brown; abdominal tergites brown, the caudal borders broadly gray, the median area more vaguely of this latter color; male hypopygium relatively large; tergite extensive, its caudal margin bilobed; outer dististyle long and slender; inner dististyle with the beak a short cultriform blade, the margin behind this with a slender acute spine; gonapophysis appearing as a conspicuous dark-colored oval blade, the stem short; ninth sternite with a conspicuous protruded pale membrane at base of the median emargination.

Male.—Length about 11 mm.; wing 14.8 mm.; antenna about 2.8 mm.

Frontal prolongation of head brown, gray pruinose, clear above; nasus reduced to a small stub, with a concentration of black setae on and near it; palpi medium brown. Antennae short; scape gray pruinose, pedicel light brown, flagellum brownish black; flagellar segments short, basal enlargements very poorly developed; verticils shorter than the segments. Head brownish gray, the front and anterior vertex clear light gray, including somewhat depressed areas on either side of the anterior vertex; a vague darkening from the summit of the very low vertical tubercle backward; occipital region restrictedly obscure orange.

Pronotum brownish gray, scutellum yellow, the central depression darker. Mesonotal praescutum light gray, with four very slightly differentiated darker brownish gray stripes that are narrowly bordered by blackish, most intense as a median vitta separating the intermediate stripes; outer margins of lateral stripes undarkened; scutum with median region light gray, the lobes chiefly occupied by two brownish gray areas that are narrowly bordered by more blackish lines, especially on their mesal edges; scutellum brownish gray, parascutella obscure brownish yellow; postnotum clear light gray. Pleura light gray, the anepisternum a trifle darker; dorsopleural region broadly light yellow. Both head and thorax unusually glabrous, the vestiture reduced to virtually microscopic black setulae. Halteres obscure yellow, the knob weakly darkened. Legs with the coxae light gray; trochanters obscure brownish yellow; femora dark brown, the bases restrictedly obscure yellow; tibiae and tarsi dark brown; claws (male) with a tooth on proximal third. Wings grayish subhyaline, variegated with pale brown, the latter appearing chiefly as a seam over the cord and at wing tip; stigma somewhat darker brown; areas that are somewhat paler than the ground before and beyond stigma and in outer end of cell *M;* veins brown. Macrotrichia on veins beyond cord, including R_{1+2} to *2nd A,* very sparse on M_4 and *1st A;* squama naked. Venation: *Rs* long, exceeding three times *m-cu;* R_{1+2} entire; petiole of cell M_1 about two and one-half times *m;* cell *1st* M_2 relatively small, pentagonal; *m* shorter than the basal section of M_{1+2}; *m-cu* shortly before the fork of M_{3+4}.

Abdominal tergites brown, the caudal borders broadly gray, the median area of the segments more vaguely of this latter color; sternites clear gray, with yellow posterior borders, broadest on segments three and four and again on sternite eight; hypopygium dark. Male hypopygium with the ninth tergite extensive, the outer portion narrowed into a yellowed apex that is bilobed by a shallow V-shaped notch; lobes densely provided with black setae; no ventral armature (as in *besselsi* and allies). Ninth sternite with a conspicuous protruded pale membrane at base of the median emargination. Outer dististyle long and slender, gradually narrowed to the obtuse tip, the length about four times the greatest breadth. Inner dististyle with the beak a short cultriform blade; sensory group placed at base of beak, consisting of relatively few areas; outer margin of style behind the beak bearing a slender acute spine. Gonapophysis appearing as a conspicuous oval dark-colored blade, the stem short. Eighth sternite transverse, the caudal margin pale, unarmed.

HABITAT: Montana.

HOLOTYPE: ♂, Logan Pass, Glacier National Park, altitude 6,655 feet, July 18, 1935 (*Melander*); Alexander Collection, through Melander.

Tipula (*Arctotipula*) *loganensis* is quite distinct from the other members of the subgenus occurring in the northern and central Rocky Mountain Region. It comes closest to species such as *T.* (*A.*) *sacra* Alexander and *T.* (*A.*) *semidea* Alexander, differing conspicuously in the coloration of the body and wings and in the structure of the male hypopygium. The body is unusually glabrous for a member of this subgenus but the assignment seems unquestionably to be correct.

Tipula (Lunatipula) rainiericola, n. sp.

Belongs to the *unicincta* group, allied to *unicincta;* general coloration of mesonotum gray, the praescutum with four entire rich brown stripes, the intermediate pair narrowed and outbowed behind; antennae relatively short, flagellum black; femora yellow, the tips narrowly blackened; wings with a weak pale brown and whitish subhyaline pattern, the latter including a major prestigmal area; male hypopygium with the appendage of the ninth sternite narrowed into a cylinder that is tipped with a brush of reddish setae; inner dististyle narrow; gonapophyses symmetrical.

Male.—Length about 13 mm.; wing 17–18 mm.; antenna about 4 mm.

Frontal prolongation of head light brown, sparsely pruinose above; nasus short and stout to virtually lacking; palpi with basal segment obscure yellow, succeeding segments dark brown, the incisures pale. Antennae with scape and pedicel yellow; basal flagellar segment pale brown, outer ones brownish black to black; flagellar segments with small basal enlargements; longest verticils slightly longer than the segments. Head above brownish gray, with a more or less distinct brown line on vertex, best indicated on the vertical tubercle.

Pronotum brown, pruinose. Mesonotal praescutum with the ground gray, with four entire rich brown stripes, the intermediate pair narrowed and outbowed behind so the central ground area is widened on posterior half; posterior sclerites of notum gray, each scutal lobe with two paler brown areas. Pleura light brown, sparsely pruinose. Halteres pale, the base of knob a little darker. Legs with the coxae and trochanters pale, yellow pollinose; trochanters yellow; femora and tibiae yellow, the tips narrowly blackened; tarsi black, the basitarsi paler at proximal ends; claws (male) toothed. Wings with a very pale brownish tinge, restrictedly patterned with whitish subhyaline; stigma slightly darker brown than the ground, relatively small; obliterative band before cord broad and conspicuous, extending into cells M_3 and M_4; no poststigmal brightening; two isolated small pale spots in cell *1st A;* veins pale brown. Venation: m longer than the petiole of cell M_1.

Abdominal tergites pale, more or less trivittate with brown, somewhat more extensive and intense on the fourth and fifth segments, the margins yellow; outer segments, including hypopygium paler brown. Male hypopygium having the ninth tergite with conspicuous, relatively broad lobes, their outer angle acute; a broad dorsal furrow; lobes separated by a relatively narrow U-shaped notch. Ninth sternite with its appendage a broad-based lobe that narrows into a short cylinder that is tipped with a brush of reddish setae. Basistyle with the ventral angle produced into a flattened sclerotized point or blade. Outer dististyle broadly expanded on outer portion, provided with very long setae. Inner dististyle with the beak relatively slender; lower beak stout; posterior crest narrow, the dorsal portion pale to subhyaline, the margin microscopically serrulate; outer basal lobe broad, with numerous long pale setae and a few scattered blackened short bristles. Gonapophyses paired, the major blade appearing as a nearly straight reddish spine, narrowed very gradually to the acute tip; at base, each spine bears a smaller flattened yellow blade. Eighth sternite with the lateral lobes very low, each terminating in a strong fasciculate bristle, with one or two much smaller setae at its base; median cushion relatively small, the relatively few setae expanded and branched at their outer ends.

HABITAT: Washington.

HOLOTYPE: ♂, Berkeley Park, Mount Rainier, August 23, 1934 (*Melander*); in Melander Collection. *Paratopotypes,* 8 ♂♂, August 23–27, 1934 (*Melander*).

Among the related species of the *unicincta* group, the present fly is most similar to *Tipula* (*Lunatipula*) *unicincta* Doane, which differs in slight details of size and coloration and, especially, in the details of structure of the male hypopygium, particularly the appendage of the ninth sternite and the inner dististyle.

NOTE ON INTRODUCED SPECIES OF CARABUS IN NORTH AMERICA.

By MELVILLE H. HATCH, Seattle, Wash.

Dr. Van Dyke's interesting and valuable recent *Review of Carabus in North America*[1] would be even more useful if the author had given more attention to the introduced species: *C. nemoralis* Müll. and *C. granulatus* L. Van Dyke properly omits the extensive European bibliography of these species, but his accounts would have benefited considerably by reference to my own[2] and W. J. Brown's[3] references to these species in America. I now have *C. nemoralis* from Tacoma, Bothell, Medina, Fife, Bellevue, Port Townsend, Bellingham, Sultan, Friday Harbor, and Mt. Vernon in western Washington; Walla Walla (1939, *M. C. Lane*), eastern Washington; and East Eagle Creek, North Fork of the Wallowa River, Oregon; and *C. granulatus* from Renton, Bothell, Custer, in western Washington.

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[1] A review of the North American species of the genus Carabus Linnaeus. Ent. Amer., XXIV, 1945, pp. 87–137, 24 figs.

[2] Notes on Carabidae. Pan-P. Ent., IX, 1933, pp. 117–121.

[3] Notes on the American Distribution of some species of Coleoptera common to the European and North American continents. Can. Ent., LXXII, 1940, pp. 65–78.

FABRICIAN GENOTYPE DESIGNATIONS.

By Richard E. Blackwelder, U. S. National Museum,
Washington, D. C.[1]

The interesting possibility that Fabricius was the originator and first designator of genotypes was brought to my attention by the articles by René Malaise in Entomological News for May 1937 and Entomologisk Tidskrift for 1938. The case therein made by Malaise appears to be a good one, at least insofar as it attempts to show that Fabricius understood the genotype concept and intended to establish genotypes in his later works. The reply to Malaise published by McAtee in Entomological News for October 1937 appears to me to avoid the crux of the matter which is the effect on the problem of the International Rules of Zoological Nomenclature.

Since these actions by Fabricius have been accepted as designations by most workers on the Hemiptera for more than a hundred years and have only recently been seriously questioned, it is very desirable to examine the proposition critically and obtain agreement on their acceptance or rejection. Such acceptance or rejection would of course apply to all orders and in all works wherein Fabricius employed his designative system.

The evidence that Fabricius did intentionally employ a definite procedure for indicating what we now call genotypes in his descriptions of both old and new genera is well presented by Malaise in 1938. A brief summary is given here.

Fabricius was the founder of a system of classification based exclusively on the mouthparts, which he considered to be the most important features of an insect. He later began to realize the advantage of pointing out one typical species in each genus which exemplified the characters of the genus and could be used as the reference point in determining exactly what the generic name applied to, in terms of his mouthpart system. For indication of this species he added to its description a detailed account of the mouthparts, drawn from special dissections and generally clearly separated from the rest of the description. At first he applied this procedure only to his new genera, but gradually he added many of the older genera. On this basis the system appears to have been systematically and consistently applied; in fact, the uniformity is surprising in a work published during that period.

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[1] Published with permission of the Secretary of the Smithsonian Institution.

Since previous discussions of the Fabrician procedure appear to have been based on the Hemiptera, it has seemed worthwhile to make a comparable tabulation of the Coleoptera. Starting with 1775, Fabricius described 41 new genera of beetles but made no type selections for these or any older genera.

In 1781 Fabricius described one new genus, *Manticora,* with a single species. He gave an expanded description of the mouthparts, not separated by a break from the rest of the text and without italics. The question of accepting this as type designation cannot arise, because the type was selected by monotypy.

In 1787 Fabricius described 3 new genera, all with more than one species but without indication of type. He did give a mouthparts description for the single species of *Lethrus* (a genus which he had not previously treated), but here again monotypy makes it unnecessary to consider the description as a type selection.

In 1792 Fabricius described 9 new genera, *Melasis* 1 (1), *Parnus* 2 (1), *Heterocerus* 1 (1), *Sagra* 2 (1), *Passalus* 3 (1), *Molorchus* 4 (1), *Colydium* 4 (1), *Lyctus* 13 (none), and *Upis* 1 (1). In each case but one the description of the mouthparts of one species (always the first) gives a clear indication of Fabricius' conception of the type. In the list above (and following) the first number following the name gives the number of species included, the one in parentheses gives the position of the selected species. *Lyctus* alone has no selection. Italics are never used, but a break before the mouthpart description is found in all. In addition to these there are type selections for 19 of the older genera. These are: *Hexodon* 2 (1), *Trogosita* 7 (1), *Scolytus* 2 (2), *Ptilinus* 4 (2), *Galleruca* 111 (10), *Cebrio* 2 (1), *Dryops* 8 (1), *Tillus* 3 (1), *Horia* 2 (1), *Cossyphus* 1 (1), *Omalysus* 1 (1), *Ripiphorus* 12 (1), *Anthribus* 9 (1), *Brachycerus* 16 (4), *Hypophlaeus* 6 (1), *Tetratoma* 2 (1), *Scaphidium* 3 (1), *Ips* 16 (6), and *Diaperis* 2 (1). The break before the mouthparts description is not as clear as in his 1801 work, but the description may be recognized readily.

In 1801 Fabricius described 20 new genera, *Chelonarium* 2 (1), *Platynotus* 12 (1), *Melandrya* 4 (1), *Galerita* 9 (3), *Agra* 3 (1), *Collyris* 3 (3), *Hydrachna* 4 (1), *Imatidium* 5 (1), *Adorium* 6 (1), *Colapsis* 417 (2), *Aegithus* 5 (1), *Allecula* 5 (1), *Cupes* 1 (1), *Brontes* 5 (2), *Trachys* 11 (1), *Aesalus* 1 (1), *Gnoma* 4 (1), *Megalopus* 2 (1), *Hylesinus* 30 (none), *Calendra* 42 (16), and *Lixus* 43 (4). Type selections are indicated for all of these as indicated, except for *Hylesinus*. There is some indication that this name is not new here. In all of these there is a definite break before the mouthpart description, and italics are used in all cases. In addition selections are made for the following 37 older genera: *Copris* 110 (29), *Ateuchus* 58 (19), *Aphodius* 65 (2), *Anisotoma* 5 (2), *Bolitophagus* 4 (2), *Pimelia* 31 (15), *Eurychora* 1 (1), *Platynotus* 12 (1), *Cychrus* 5 (1), *Carabus* 223 (18), *Calosoma* 10 (9), *Anthia* 16 (4), *Odacantha* 6 (1), *Drypta* 2 (1), *Spercheus* 1 (1), *Trichodes* 9 (7), *Corynetes* 5 (1), *Anthicus* 23 (4), *Sarrotrium* 1 (1), *Dorcatoma* 1 (1), *Peltis* 4 (1), *Eumolpus* 26 (2), *Helodes* 5 (1), *Cyphon* 12 (1), *Erotylus* 29 (19), *Eumorphus* 2 (1), *Cnodulon* 7 (1), *Atopa* 3 (2), *Cistela* 28 (1), *Dastytes* 12 (1), *Dircaea* 11 (1), *Pytho* 3 (3), *Clytus* 38 (8), *Brentus* 27 (14), *Catops* 6 (2), *Triplax* 3 (1), *Engis* 5 (1), and *Stenus* 6 (2). In all these the break is evident and the italics are used.

In summary we may note that prior to 1792 Fabricius had apparently already conceived the idea of type species and had developed a method of identifying the type species in his descriptions. In the Coleoptera the first attempt to apply this idea systematically was made in 1792 in the Entomologia Systematica. Here 118 genera are treated, 9 of them new, with selections for 8 of the new and 19 of the old. The species selected is often but by no means always the first one listed. In no case is more than one species selected in a genus.

In 1801 in the Systema Eleutheratorum 185 genera are treated, 20 or 21 of them new, with selections for 20 of the new and 37 of the old. Here the system of selection is fully developed (as used in later works on other orders) with the descriptions clearly set off and with italics employed in every case. In 27 cases the species selected stands first in the list, in 25 cases it is later (as far down the list as the 29th), and in 6 cases there was only one species listed. No evidence of any sort was seen that the method was not applied uniformly and consistently, (1) for the new genera, and (2) for an increasing number of the older genera, as material was available for dissection or as other circumstances permitted.

Any discussion of the acceptance of the Fabrician actions as genotype designation must be based on Article 30, g of the International Rules, which states, "The meaning of the expression 'select the type' is to be rigidly construed. Mention of a species as an illustration or example of a genus does not constitute a selection of a type." Opinion 61 might be considered to have a bearing on this rule since it states of one of Fabricius' designations, "I cannot find a positive designation" and "The secretary does not accept Laporte (1832, 51) and Fabr. (1803, 112) as definite type designation."

In Opinion 81 the Commission considered the genotypes and status of *Cimex* and three other generic names. In the statement of the proposition no direct reference is made to the possibility of designation by Fabricius except to state that the secretary does not accept Fabricius 1803 as definite type designation. There is no discussion of the Fabrician works and no presentation of the basis for the claims, and there is no evidence that the other commissioners intended individually to pass on the validity of the claims, except in following the secretary in disregarding entirely the possibility that a designation had been made by Fabricius.

Inasmuch as it is clear that the Commission did not specifically consider the question of the Fabrician designations, it can scarcely be argued that the Opinion settles the question of whether designations were or were not made. The argument therefore rests largely on Article 30, g.

Article 30 specifies that type species of genera may be fixed in the original publication by four means: (1) when one of the species is definitely designated as type, (2) if *typicus* or *typus* is used as a new specific name for one of the species, (3) when there is only a single original species; and (4) in cases of absolute tautonymy. The Article also states specifically that, "The meaning of the expression 'select the type' is to be rigidly construed." There could scarcely be any argument that Fabricius did make valid type selections in some cases by means of the methods in (2), (3), or (4) above. We are thus restricted to consideration of method (1), definite original designation of types (as rigidly construed). It thus appears that the acceptance or rejection of the Fabrician designations depends solely upon whether his actions constitute selection of types in a rigid sense under this Article.

Nearly all writers on this subject, and such modern taxonomists as I have consulted, agree that Fabricius did have the basic genotype conception when he prepared the enlarged morphologic mouthpart descriptions for one species in each of the genera so treated. There seems to be little question that this was much more true of Fabricius than of Latreille and many later workers. The admission of this fact, so aptly put by McAtee and Malloch in 1926, leaves as the only reason for not accepting the Fabrician designations the fact that he nowhere used the word "type." I can find no valid argument involving any other principle than this, and I have obtained an admission from several opponents of acceptance that this is the only ground for rejection. Assuming that this is the case, let us examine the basis for it.

Several methods have been used without question for designating a genotype without making use of the word "type" or any of its forms. Article 30 definitely approves original designation by means of absolute tautonymy, where one specific name is of the same spelling as the generic name. In Opinion 7 the Commission specifically states that the use of the expression "n. g., n. sp." is an acceptable form of designation. Beyond these there are many means of expressing one's intention of designating genotypes without the use of the word type, such as, "This new genus is based on the species *albus*, with which *niger* and other species are congeneric," or "In each case the first species treated is the one upon which the genus is founded." Expressions such as these have been used many times, even by modern writers, and their validity as genotype designations, while perhaps open to question, has very generally been assumed.

There are thus at least three[2] accepted methods of designating genotypes without use of the word "type." In view of this it would appear to be very difficult to justify the position of refusing acceptance of the Fabrician designations, when it is admitted that he understood the genotype concept and applied it consistently.

This discussion would not be complete without some comment on McAtee's reply to Malaise.[3] In his 1926 paper McAtee outlines the history of type designation in the Hemiptera from Latreille to about 1900, pointing out that few of the writers during this period made a practice of naming genotypes or show any sign of understanding the concept and its implications. He summarizes that "conscious selection of genotypes is a comparatively modern development in taxonomy." In consideration of this situation, McAtee concludes that there is "no probability whatever . . . that Fabricius in 1803 or earlier as in 1794 (as some authors claim) took action that we can consider as genotype fixation."

It is very difficult to see much logic in this argument. McAtee has himself stated that the earliest of the accepted early designators (Latreille) was the only one whose designations were consistent, and which are acceptable on their own account rather than "because of *ex post facto* considerations." The possibility that Fabricius only ten or fifteen years before Latreille might have had a comparable or even better understanding is not in any way related to the actions of subsequent workers. The evidence that Fabricius did designate genotypes both definitely and consistently is very strong, as given by Malaise in 1938 and summarized above. Whether we accept these designations under the Rules cannot be properly influenced by the decision on later workers but only on the merits of this case under Article 30.

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[2] The use of the NAME *typus* or *typicus* is an additional officially approved means of designation which can be considered to be different from the use of the WORD type or typical.

[3] These remarks are in full accord with those of Malaise on this subject. They are given to emphasize certain points and to corroborate the conclusions reached by Malaise as to the inadequacy of the criticism.

McAtee continues with the statement that only once in the Systema Rhyngotorum did Fabricius cite only one species in a new genus and the implication that therefore this is the only case which might be considered designation. It appears to me that McAtee is here neglecting the entire basis of the claim for Fabrician designations. This genus IS the only monobasic genus, but it is not an example of designation, as pointed out by Malaise.

The statistics given by McAtee appear to have little bearing since the system as gradually developed by Fabricius did not require simultaneous designation of types in all genera in one work, or repetition of a designation once made. These matters are fully covered by Malaise in his 1938 description of the Fabrician method. The conclusion of McAtee that Fabricius would have given uniform treatment to all genera is entirely contrary to the facts of the system used by Fabricius. It is true that the designations in the earlier works are on the same basis as the later ones, but the few cases of absence of the italicizing system or the paragraphing arrangement used by Fabricius consistently for his later designations, are readily accounted for as typographical errors (of a type far more easily made and harder to correct in those days than now).

The four cases of apparent inconsistencies cited by McAtee are adequately explained by Malaise in 1938. The explanations are not really necessary since the later (1803) actions of Fabricius are not pertinent to the question of whether his 1794 designations were valid. Every genotype designation by any author must be examined upon its own merits, and the fact that some of Fabricius' designations are not acceptable does not affect the others. (Compare the present treatment of the "designations" of Laporte and Lamarck.)

McAtee's examination of the Philosophia Entomologia of 1778 to determine whether Fabricius had mentioned his intention of selecting genotypes appears to be largely irrelevant. This work appeared at least fourteen years before the first group of designations. Fabricius rarely made any explanatory remarks in his later works, and no modern writer has claimed to have seen any statement by Fabricius about type selection. But Fallén is said to have stated definitely that Fabricius did make such a statement, and contrary to

McAtee's opinion, a subsequent statement by Fabricius that he had intended to select types would have a very pronounced effect on the question of acceptance of his designations.

In the absence of proof of such a statement by Fabricius (and I have been unable to find it either in Fabricius' later works or in Fallén's), the decision must be made solely on the matter of the omission of the word "type." As indicated above, I do not see how the omission of this word can be held to be of determining importance, in view of the fact that the Rules and the Opinions both recognize other methods of type selection not employing that term.

THE MEMBER'S CORNER.

Dr. George S. Tulloch has rejoined the Biology Department of Brooklyn College following his discharge from the Navy. During the war he served with the rank of lieutenant and was assigned to malaria control work in the campaigns in North Africa and Sicily. Returning to the United States, he trained men for this type of work at the Naval Hospital Center at Bethesda, Maryland. Subsequently Dr. Tulloch was sent to the Philippines, the China coast and Japan to make a detailed survey of Schistosomiasis, a disease he had previously observed in Puerto Rico. Schistosomiasis is caused by parasitic worms found in certain fresh-water snails and is acquired by contact with infected streams and ponds. The worms penetrate the skin and work their way to the abdomen which becomes greatly enlarged. No cure is known and in the Orient the disease is usually fatal.—R. R. McE.

Dr. Mortimer D. Leonard is now actively gathering material and new records for a supplement to the New York State List of Insects. He will be glad to receive this data promptly.

He is now in the office of Foreign Plant Quarantine of the U. S. Bureau of Entomology and Plant Quarantine, preparing information on foreign injurious insects which might possibly be introduced into this country through commercial interchange. Records and other data for the N. Y. List may be sent to him either at the Bureau or at his personal address, 2480–16th St., N.W., Washington 9, D. C.

NEW COLLEMBOLA FROM NORTH CAROLINA.

By D. L. Wray, Raleigh, N. C.

In preparing a list of the insects of the Order Collembola occurring in this region many collections have come to my attention and this paper will describe some of the new forms thus found. Four new species are described, three belonging to the Suborder Arthropleona, and one to the Suborder Symphypleona.

The new species are:—**Achorutes jondavi,** n. sp., **Xenylla carolinensis,** n. sp., **Entomobrya beaucatcheri,** n. sp., **Ptenothrix pineolae,** n. sp.

Family Poduridae.

Genus *Achorutes* Templeton.

Achorutes jondavi, n. sp. (Figs. 1–7)

Length up to 1.6 mm. Body with yellow background sprinkled with reddish-rust colored specks which are heavier on head and antennae. Antennal joint 4 heavily rust colored all over. Underparts of body and head lighter, sparsely specked. Rust spot between eyes. Antennae shorter than the head. Relative length of antennal joints as 2.5:2.5:3:4. Sense organ of third antennal segment consists of two small, slightly bent sense rods (Fig. 1). Eyes eight on each side. Eye patch black with 3 stout spines. Post-antennal organ consists of 4 tubercles, the anterior ones are elongate-oval, the posterior ones somewhat triangular in shape (Fig. 2). Unguis long, slender, slightly curving, with well developed tooth near the middle of the inner margin. Unguiculus extending half as far as unguis with a well rounded basal lamella, the apical half ending in an acuminate spine (Fig. 3). One long, simple curving tenent hair. Rami of tenaculum 4-toothed. Dentes twice as long as mucrones. On the dorsal surface of each dens are 7 setae, the proximal one being the longer, the inner 4 setae slightly winged. Mucro somewhat slipper-shaped with a tuberculate outer lamella bearing a prominent obtuse angle (Fig. 4). Anal horns two-thirds length of hind unguis, stout, slightly curving, separated basally. Clothing of rather long, curving setae becoming abundant posteriorly. In outline one long, curving, and 2 to 3 shorter setae to each segment.

A. jondavi is closely allied to *A. bengtssoni* Agren (1940, p. 2) but does not have the apically swollen dentes. The latter species is olive brown with short anal horns. Also *A. jondavi* differs from this species in shape of post-antennal organ, lamellate unguiculus, well-developed inner tooth on unguis, difference in shape of mucro, and size of anal horns.

This species is close to *A. californica* Bacon but differs in shape of mucro, post-antennal organ, anal horns, and other characters.

Locality: This species was found abundant in fungi on a rotten log in Bloomsbury Park, Raleigh, N. C., Dec. 9, 1943, by D. L. Wray and C. S. Brimley. Described from some 30 cotypes.

FAMILY PODURIDAE.

Genus *Xenylla* Tullberg.

Xenylla carolinensis, n. sp. (Figs. 8–16)

Length up to 0.5 mm. General background color yellowish-white with blue to faint purplish pigment evenly distributed over body in the form of semicircular spots. Venter, legs, furcula, and segmental sutures lighter. Antennae shorter than head or as 13 : 20; third and fourth segments but feebly demarcated, the fourth bearing many bristles, and apical retractile sense club, three dorsal large bent sense rods, two laterally, one dorsally and back from the apex is long, curving reaching over tip of antenna (Fig. 14). Organ of third segment of two short sense rods behind fold. Eyes (Fig. 8) five on each side. Unguiculus absent. Unguis (Fig. 13) minutely tuberculate, rather straight, untoothed. Tenent hairs two. Furcula short not extending to apex of abdomen. Dens to mucro as 4 : 3, clearly demarcated (Fig. 12). Dens with two curving hairs subequal to mucro in length. Mucro (Fig. 12) with a large external lamella which appears finely tuberculate, and reaches all the way to the strongly turned-up apex of mucro and folds in middle giving impression that mucro is bent in middle. Anal horns two, small almost straight, on basal papillae which are almost as long (Fig. 11). Clothing (Fig. 9) of short curving hairs on head and body. On the legs the hairs are straighter and become longer apically. On the last two abdominal segments the hairs are much longer and curve backwards (Fig. 10). There are dorsally two rows of long, curving hairs on fifth abdominal segment. One long hair on outside of each anal horn and one in between (Fig. 11). These hairs appear feebly enlarged at apex.

Locality: Six miles east of Raleigh, N. C., under dead leaves in cavity under dead stump on banks of Neuse river, May 5: eight specimens (M. W. Wing, collector).

This species is close to *X. welchi* Fols. in the shape of mucro and lamella and to *X. baconae* Fols. in shape of unguis.

FAMILY ENTOMOBRYIDAE.

Genus *Entomobrya* Rondani.

Entomobrya beaucatcheri, n. sp.

Length 0.75 mm. Ground color yellow-white, pigment blue to purple on the following parts. Antennal joints 1 and 2 light blue, heavier at apices, 3 and 4 more heavily blue pigmented. Head with scattered light blue pigment throughout, a pigmented line connects eyespots along anterior edge of head. Eye patches irregular and black. Dorsum of thorax and abdominal segments 1, 2, and 3 heavily mottled with blue to purple pigment forming a very distinct broad band over this entire region. Abdominal segment 4 yellow-white, some specimens may show a very faint trace of bluish pigment scattered over the segment. Coxae heavy blue. Other parts of legs gray to yellow. Furcula yellow throughout (Fig. 24). Eyes (Fig. 23) eight on each side in an irregular patch, inner two ocelli smaller than rest. Antennae slightly longer than head or as 75:90. Relative lengths of the antennal segments as 12:19:17:40. Fourth abdominal segment 5 times the length of the third. Unguis nearly straight with one outer and 2 pairs of inner teeth. Unguiculus narrow, unarmed, lanceolate, about three-fourths length of unguis (Fig. 25). The fringed hairs on end of tibio-tarsus vary in length, some reaching tip of unguiculus.

Manubrium to dentes as 58:70. Dentes with dorsal crenulations ending 4 times the length of mucro from distal end. Mucro (Fig. 26) as usual in shape, with apical and anteapical tooth, and basal spine; the distal tooth curved more than usual. Antennae, head, and body with many curving fringed hairs, those on legs as long as those on manubrium and dentes. Dentes with usual long fringed setae dorsally, shorter ones ventrally.

This species is one of the smallest *Entomobrya* that I have come in contact with either in collecting or in literature.

Locality: Collected from leaf mould on Beaucatcher Mt., near Asheville, N. C., September 10, 1944 (D. L. Wray, collector).

FAMILY SMINTHURIDAE.

Genus *Ptenothrix* Börner.

Ptenothrix pineolae, n. sp.

Length up to 1.5 mm. General ground color yellow. With four broad deep purplish-black bands on dorsum as follows: a band on head crosses vertex, including eye patches, and reaches down sides of the head to lower edge of cheeks; a broad band covers anterior half of body and reaches almost to coxae, leaving a dorsal irregular yellow patch; a narrower band crosses abdominal segments 3 and 4; a ventro-lateral purple patch on middle of body; the ano-genital segment is covered by a purplish-black band dorsally and laterally. Legs, manubrium, and first two antennal joints faint purple; last two antennal joints dark purple; eye patch dark. Venter yellow. The pattern of the purple bands varies slightly in different individuals (Figs. 17 & 20). Eyes eight on each side. Antennae longer than head or as 80:35; antennae to body as 80:64. Relative length of antennal points as 6:29:35:10. Antennal joint 3 with 6 annulations in apical half; 4 with 4 distinct joints and 7 to 8 whorls of hairs (Figs. 17 & 18). Unguis (Fig. 22) with 2 inner well-defined teeth and 2 lateral teeth on each side. Unguiculus (Fig. 22) with a basal spine and a long curving subapical bristle which exceeds the length of the unguis. Manubrium to dens to mucro as 10:22:8. Dens with 2 rows of dorsal bristles most of which are serrate, and with four dorsal long, outstanding pinnate hairs; ventrally with 1 short basal hair, 4 median and 2 outer long appressed hairs distally. Mucro (Fig. 21) with both dorsal margins roundly toothed.

Clothing of head consists of short spine-like setae anteriorly and much longer setae posteriorly. The hairs on dorsum of body are long spine-like anteriorly becoming much shorter posteriorly; then very long and spine-like on ano-genital segment. Bothriotricha 3 on each side. There are 2 stout, bilaterally serrate setae on the posterior surface of each posterior tibio-tarsus. Anal appendages of female are bristle-like, slightly curving.

Locality: This species was taken from humus and leaf-mould under hemlock trees near Linville River, Pineola, N. C., June 26, 1943 (D. L. Wray, collector).

Cotypes of the new species described herein are in the author's collection. I wish to express my sincere thanks and appreciation to

Dr. Harlow B. Mills, Montana State College, Bozeman, Montana, for his generous help and suggestions, and for examining most of these forms.

EXPLANATION OF PLATES.

PLATE I. *Achorutes jondavi,* n. sp. FIG. 1. Right antenna. 2. Left eye patch and post-antennal organ. 3. Right hind foot. 4. Tenaculum. 5. Left dens-mucro. 6. Anal horn. 7. Integument. *Xenylla carolinensis,* n. sp. 8. Left eye patch. 9. Integument. 10. Hairs and integument of anal region. 11. Anal horns. 12. Dens-mucro. 13. Hind foot. 14. Antenna. 15. Fourth antennal segment. 16. Type of pigmentation spots.

PLATE II. *Ptenothrix pineolae,* n. sp. FIG. 17. *P. pineolae,* n. sp. 18. Antenna. 19. Third antennal organ. 20. Dorsal view. 21. Dens-mucro. 22. Hind foot. *Entomobrya beaucatcheri,* n. sp. 23. Right eye patch. 24. Lateral view. 25. Hind foot. 26. Dens-mucro.

HOW TO BECOME AN ENTOMOLOGIST.

Oh, to name a species
Now that spring is here.
And who would name a species
Would leave his name for 'ere.

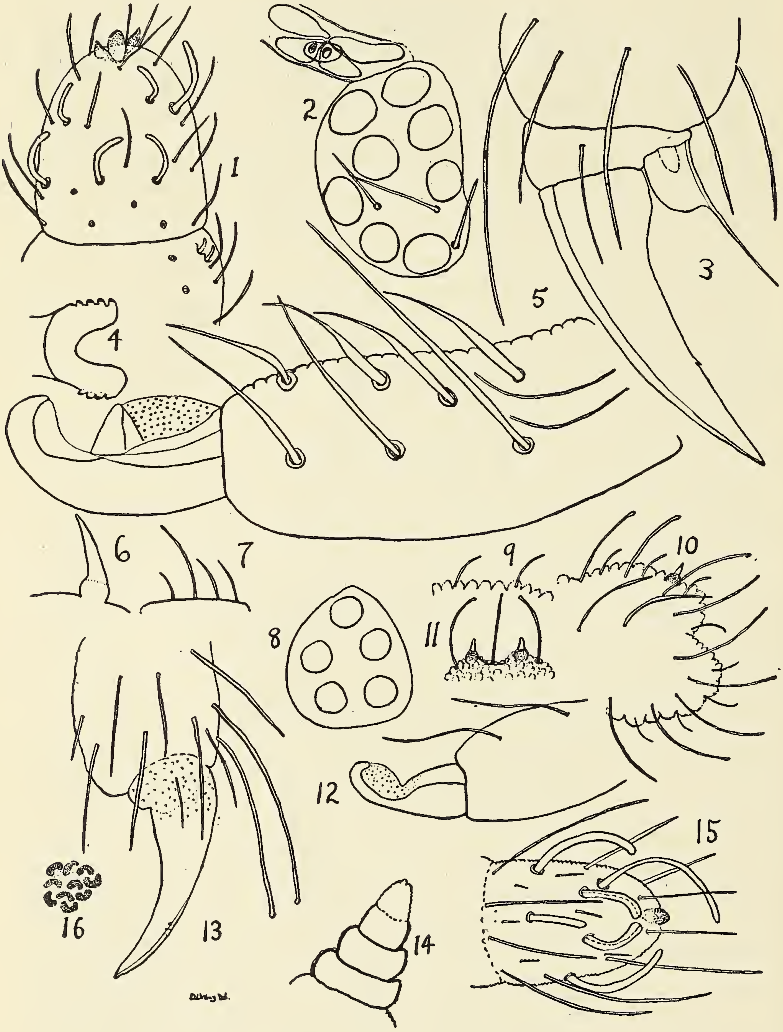
Proclaim the tarsi "longer"!
Confuse the setal hair.
Declare the palpi "darker."
A muddled key, prepare.

So, go you! Name your species.
Describe in verbiage prim,
From cerci to antennae
This holotype so trim.

Go, you, name the species,
If taxonomy's your whim.
However it is published, it's
Another synonym. . . .

ALBRO T. GAUL,
Brooklyn, N. Y.

BULL. B. E. S., VOL. XLI PLATE I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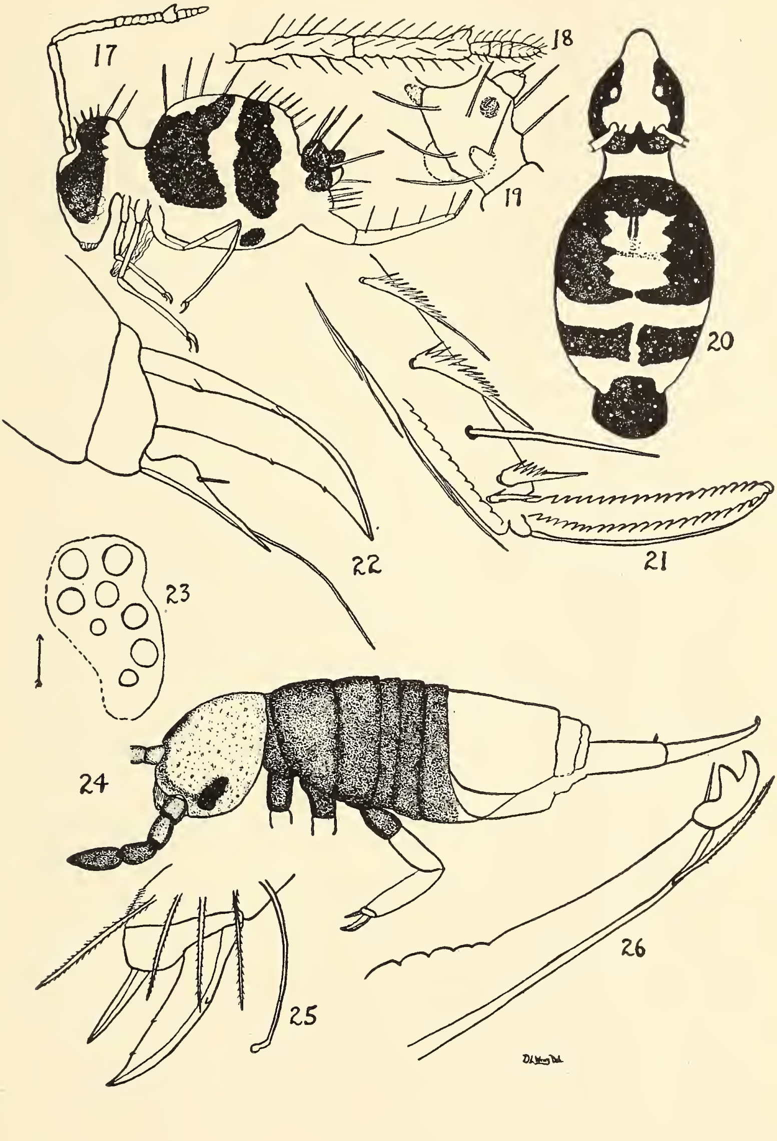
BULL. B. E. S., VOL. XLI PLATE II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MECIDEA MINOR, A NEW SPECIES OF PENTATOMID FROM NEW MEXICO.

By Herbert Ruckes, New York, N. Y.

Up to the present writing, hemipterologists have recognized only one North American species belonging to the pentatomid tribe Mecidiini. That species is *Mecidea longula* Stål, described in 1854. Recently, while sorting pentatomids, collected during various trips to the Rocky Mountain states since 1932, a number of specimens of the genus *Mecidea* were found which differ from the accepted description of *M. longula* in so many respects that there can be no doubt that they represent a new and an additional species of the genus. Due to their smaller size and paler color, when compared with *M. longula,* the specific name **minor** has been given them. In some respects the specimens show relationship to the African species *M. pallida* Stål, but again differ in their smaller size.

For sake of comparison both *M. longula* and *M. minor* are herewith described.

Mecidea longula Stål

Form narrowly elliptical, color testaceous to gray yellow with fuscous lineations usually forming four longitudinal bands through the thorax, the two middle ones continuous onto the scutellum; fuscous markings, when present on venter, in form of bands near lateral margins of thorax and abdomen; head about one-third longer than wide through eyes; juga longer than tylus, usually divergent at apex so that the tip of the head is narrowly truncate; a preapical sinus is usually present and its lateral margins are not parallel (Fig. A); pronotum more than half again as wide as long through median line, sometimes almost twice as wide; its surface coarsely punctate, somewhat transversely rugose; a median impunctate carina obsolescent or wanting; canal of the metasternal orifice attenuated into a tapering, slightly arcuate ridge, extending three-quarters or more across the metasternal plate; the black spot diagonally behind each spiracle prominent, as big as or bigger than the spiracle, an impressed transverse bar in front of each spot granulated and prominent; the abdominal striae coarse and easily recognizable; lower lip of male genital cup somewhat upturned, its edge forming a shallow U-shaped border, sometimes with a pair of opposing blunt denticles at the base of the U (Fig. B); the upturned portion of the cup shallowly impressed transversely; posterior angles of the cup bluntly rounded; not elongated, terminal segment in female usually more than twice as wide as long (Fig. C).

Although Stål, in his original description, gives the dimensions of *M. longula* as 9 mm. long and 2¾ mm. wide, all specimens the present writer has ever seen are always considerably larger. In general the specimens that have been examined average 12 mm. long by 3¾ mm. wide, more nearly the size of *M. pallida* Stål (13 mm. × 4 mm.).

Mecidea minor, n. sp.

Form narrowly elongate, slender, pale straw yellow with fuscous lineations faint, obsolescent or wanting; head one-half again as long as wide through the eyes; juga longer than tylus, converging to an acute apex; a preapical sinus usually wanting, but if present, narrow, and its lateral margins parallel (Fig. D); antennal segment two more strongly triquetral than in *longula,* especially near base; pronotum about half again as wide across humeri as long through median line, its surface finely punctate and not evidently rugose and with a median pale, impunctate line forming a weak carina continuous through the scutellum; canal of metasternal orifice somewhat elongated but not attenuated into a long tapering tip and not reaching more than two-thirds the distance across the metasternal plate; the black spot diagonally behind each spiracle minute (usually smaller than the spiracle) or wanting, the impressed transverse bar in front of it inconspicuous or obsolescent; the abdominal striae very delicate and barely visible; lower lip of the male genital cup hardly upturned, its edge forming a prominent V-shaped border about the basal angle of which are two or three blunt denticles; the posterior angles of the cup elongate, narrowly rounded (Fig. E); terminal segment of female not more than twice as wide as long, usually less (Fig. F).

Described from fifteen specimens.

Type: Male—Las Cruces, Dona Ana Co., New Mexico, August 28, 1937. Length 9 mm.; width across humeri 2.33 mm.

Allotype: Female—Las Cruces, Dona Ana Co., New Mexico, August 28, 1937. Length 10 mm.; width across humeri 2.75 mm.

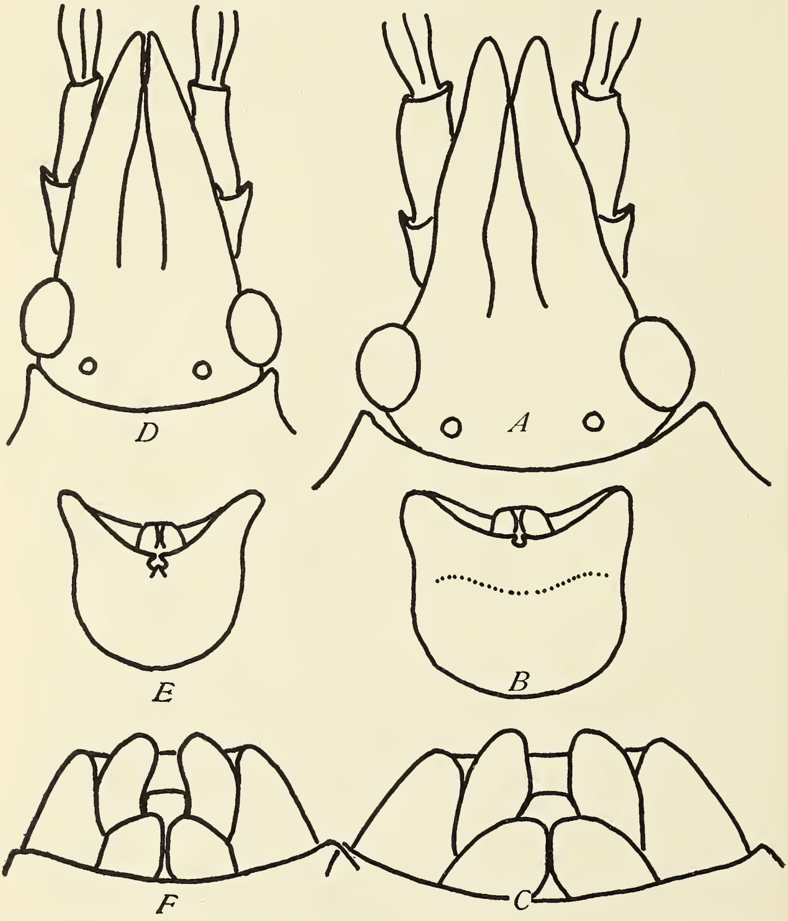
Types deposited in the American Museum of Natural History. Acc. Number 40871 A.M.N.H.

Paratypes: Five males, Las Cruces, Dona Ana Co., New Mexico, August 28, 1937. Nine females, six from Las Cruces, Dona Ana

Co., N. M., August 28, 1937; one, Rist Canyon, Fort Collins, Colorado, August 30, 1935; one, Santa Fe Canyon, Santa Fe, N. M., July 20, 1932; one, Kits Peak Rincon, Baboquivari Mts., Ariz., August 1–4, 1916 (Am. Mus. N. H.).

All deposited in author's collection.

In all proportions *M. minor* is less robust than *M. longula;* it is paler, with most fuscous markings obsolete or obsolescent; in color and structure of the head, it is nearer to *M. pallida* Stål, but again considerably smaller than that species; it apparently is a species to be found in the western and southwestern states, feeding on grasses such as *Boutelloua curtipendula* (Michx.) Torr., from which all the Las Cruces records were taken.



TWO NEW PSAMMODIUS FROM SOUTHEASTERN UNITED STATES (COLEOPTERA, SCARABAEIDAE).*

By O. L. Cartwright, Clemson, South Carolina.

It is a pleasure to name the first of the following species of *Psammodius* in honor of Professor Franklin Sherman of Clemson College who has long been interested in the insect fauna of North and South Carolina. The second species is named for its collector, Borys Malkin, who has collected many fine species of Scarabaeidae for the writer.

Psammodius shermani, n. sp.

Holotype: Length—3.75 mm.; width—1.8 mm. Oblong, slightly widened posteriorly, shining, dark castaneous, pronotum and occiput piceous, femurs and underside somewhat lighter. Head coarsely rather densely verrucose, occiput smooth, polished, clypeus widely moderately emarginate, the triangular tooth each side and margin slightly reflexed, sides evenly rounded to moderately prominent genae. Pronotum two-thirds as long as wide, strongly convex, front angles rounded, hind angles very obtuse, scarcely defined, sides evenly arcuate, margins crenate fimbriate, basal marginal line strong and entire, surface at sides beyond the vague fovea smooth with sparse minute punctures, anterior two-thirds of disc weakly irregularly wrinkled, finely punctate, posterior third with a wide transverse band of very coarse closely placed punctures. Elytra two-fifths longer than wide, striae strongly impressed, crenate punctate, the intervals weakly convex, minutely irregularly punctate. Mesosternum and sides of metasternum anteriorly finely sculptured. Metasternum otherwise minutely sparsely punctate, smooth and shining, median longitudinal groove strong and deep, rather abruptly terminated at each end. Abdominal segments shining, finely crenate in front, each with a single transverse row of coarse setigerous punctures interrupted at middle. Pygidium with fine sculpture basally and a few scattered moderate punctures. Middle and hind femora stout, with a row of close coarse setigerous punctures parallel with hind margin; posterior tibiae stout, subtriangular, transverse ridges not well defined but traces of three visible; terminal spurs narrowly foliaceous, the longer subequal in length to first two tarsal joints. Sex not determined.

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* Technical Contribution No. 130, from the South Carolina Agricultural Experiment Station, Clemson, S. C.

Holotype deposited in the United States National Museum.

Type locality: Sullivans Island, South Carolina. Holotype collected June 27, 1945 by O. L. Cartwright.

Paratypes: Three taken with the holotype under a thin line of debris around a depression back of the beach after a storm; two from Tybee Island, Georgia, collected by H. A. Wenzel (in the H. W. Wenzel Collection at Ohio State University).

Psammodius shermani is closely related to *Psammodius armaticeps* Fall. It differs from that species mainly in having the coarse pronotal punctures grouped in a transverse band behind the middle. The tarsi are somewhat longer in *shermani* also. The typical series of *shermani* was compared with a long series of *armaticeps* from Tampa, Florida. The Tybee Island specimen mentioned by Dr. Fall in his description of *armaticeps* has been examined and is identical with *shermani.*

Psammodius malkini, n. sp.

Holotype: Length—2.9 mm.; width—1.5 mm. Oblong, slightly widened posteriorly, shining, castaneous, legs and underside somewhat lighter. Head coarsely verrucose, the occiput smooth, polished, clypeus widely moderately emarginate, rounded each side, margin slightly reflexed, sides evenly rounded to the obtusely rounded moderately prominent genae. Pronotum three-eighths wider than long, front angles rounded, hind angles very obtuse, sides entire, evenly arcuate, fimbriate, base moderately lobed medially, slightly sinuate each side, sides and base finely margined, the marginal line moderately punctate, surface very finely sparsely punctate throughout, an anterior postapical transverse line of closely placed coarse punctures in a deep groove from one anterior angle to the other, a similar median groove longitudinally over basal two-thirds and another of about same length transversely inward from each side, disc otherwise with scattered coarse punctures. Elytra nearly one-fourth longer than wide, striae deep, crenately punctate, intervals weakly convex, very finely irregularly punctate. Mesosternum and sides of metasternum anteriorly alutaceous and very shallowly moderately punctate. Metasternum otherwise shining, minutely sparsely punctate, median longitudinal groove fine, scarcely impressed. Abdominal segments sparsely minutely punctate and very finely alutaceous, segments apparently not crenate in front. Pygidium bordered apically with a row of ten long hair-like setae from moderate punctures. Posterior femora stout, minutely alutaceous, two or three setigerous punctures paralleling posterior edge and a similar row along the anterior edge; middle femora not half as wide as posterior and with marginal rows of setae strongly developed; posterior tibiae two-fifths as wide as long, transverse ridges absent; spurs narrowly foliaceous apically, the longer as long as first two tarsal joints combined. Sex not determined.

Holotype deposited in the United States National Museum.

Type locality: MacDill Field, Tampa, Florida. Holotype collected at light May 20, 1943, by Borys Malkin.

Paratypes: Sixteen taken at same place between May 20 and June 12, 1943, by Borys Malkin. They vary from 2.8 to 3.3 mm. in length. In several specimens the irregularly placed coarse punctures of the pronotum are reduced in number to ten or twelve each side of the median line and are scattered over posterior half of the pronotum.

Psammodius malkini is nearest *Psammodius hydropicus* Horn but is not so greatly inflated, the elytral striae are deeper and rather coarsely crenate, the elytral intervals are more convex, the sides of the pronotum are entire, the pronotal punctures are coarser and deeper, and the eyes are well developed. In *hydropicus* the pronotum has the lateral edges crenate and the eyes are vestigial.

New Records of Sphecoid Wasps from the Northeastern United States.—*Euplilis* (*Euplilis*) *clavipes* (L.). Maine: Bar Harbor, July 8, 1938. New Hampshire: Cannon Mt., White Mts., August 9, 1945. This common Eurasian species has hitherto been known in America from only the Mt. Rainier district in Washington.

Euplilis (*Alliognathus*) *occidentalis* (Fox). New York: Axton, Franklin Co., Adirondack Mts., July 12–22, 1901. Previous records of this uncommon species are all from the states of Washington and Oregon.

Oxybelus bipunctatum Olivier. Maine: Bridgton, Cumberland Co., August 11–15, 1945. This common European species has been taken previously at Ithaca and on Long Island, New York, and was recently found to be common at Washington, D. C.—V. S. L. Pate, Ithaca, N. Y.

THE THORACIC STRUCTURE OF WORKER ANTS OF THE GENUS PHEIDOLOGETON.

By George S. Tulloch, Brooklyn, N. Y.

The worker caste of many of the species of *Pheidologeton* is made up of a polymorphic group of individuals varying considerably in size and structure. According to their size these workers arbitrarily are divided into three groups and referred to as major, media and minor forms. In some species the intermediate forms are absent and the major forms are called soldiers and the minor forms are referred to as the workers. In the development of a colony established by a single queen the first brood always consists of minor forms whereas the succeeding broods may contain the larger forms. Queens do not appear until after the largest workers have been produced which may be a matter of four to six years. Similar slow successions of small workers, large workers and queens have been noted in *Atta, Pheidole,* and *Camponotus.* This phenomenon is a constant one in species with polymorphic workers and has been interpreted by some as being dependent upon the gradual improvement in the trophic status of the ant colony. It has been presented as an argument in support of the trophogenic hypothesis of caste determination.

Continuous series of forms from the major to minor workers may be arranged within these polymorphic species. Except for size the composition of the head and abdomen remains essentially the same throughout the series but in the thorax it is possible to note differences in the composition of the sclerites. A consideration of these thoracic changes as found in *Pheidologeton diversus* subsp. *philippensis* is given here. The specimens of this series were studied in a liquid medium with the aid of a binocular microscope. The scale drawings were made with the aid of a cross-line ocular micrometer disc and graph paper. The specimens were made available through the generosity of the late Professor William M. Wheeler.

The thorax of the major worker of *P. diversus* (Fig. 1) although only one-third as large as that of the winged queen exhibits many of the regions and sutures of the winged thorax. The scutellum (SCM) is prominent projecting from the posterior portion of the mesonotum (MSN). The prescutellum (PRS) is recognizable in its dorsal region as an inverted V-shaped area; ventrally it is fused with the mesopleuron. The metanotum (MTN) is present as a conspicuous area posterior to the scutellum. Due to the absence of wings and wing insertions a fusion of the notal and pleural regions has taken place both in the meso- and metathorax although in the mesothorax the line of fusion is indicated by a ridge (A). The media workers show various transitional stages (Figs. 2, 3, 4) toward the minor worker (Fig. 5) and the following changes may be noted.

1. Disappearance of the prescutellum and the ridge between the mesonotum and mesopleuron; the fusion of the metanotum and the propodeum (Fig. 2).
2. Disappearance of the metanotum and the episternal suture; the fusion of the pro- and mesonotum (Fig. 3).
3. Disappearance of the scutellum (Fig. 4).

Although the series described above exhibits continuous gradations between the large and the small workers there is an absence of any forms connecting the queen and the worker, *i.e.,* between the winged and wingless female. This absence of forms bridging the gap between the large workers and the queens would appear to weaken the hypothesis that the castes of *Pheidologeton* are trophogenically determined.

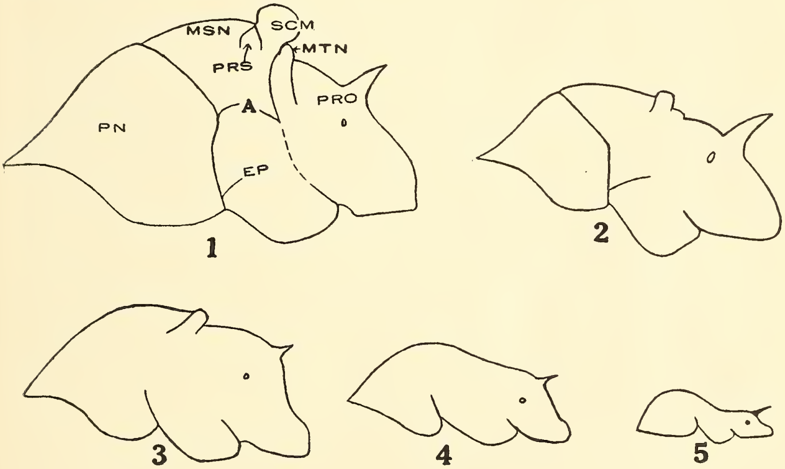

FIG. 1. Thorax of major worker of *P. diversus.* A = mesonotal-mesopleural ridge; EP = episternal suture; MSN = mesonotum; MTN = metanotum; PN = pronotum; PRO = propodeum; PRS = prescutellum; SCM = scutellum. Figs. 2, 3, 4. Thoraces of media workers. Fig. 5. Thorax of minor worker.

ON HEPEROTINGIS ANTENNATA DRAKE.

By J. R. de la Torre-Bueno, Tucson, Arizona.

Heperotingis antennata Drake, has heretofore been known only from the type, in the Drake collection and from some few specimens in other collections, both public and private.

To my surprise on July 23, 1932, at Tannersville, N. Y., I swept 2 macropterous specimens; and again on August 9, 3 more were taken, one macropterous, the two others brachypterous, and on the 13th, five more, one macropterous. These were taken in one definite spot—an upland sloping field with a southern exposure, just above the Tannersville main street. They were taken by sweeping low—in fact by scraping the ground itself—on both sides of a footpath running through bushes and on the mowed area, in the longish grasses, close to their roots. They also seemed to be found in the shade, preferably of willow; the foodplant was indeterminate, under the conditions. There was the usual weedy growth—grasses, sedges, trailing blackberry, golden rods, plaintain, meadow sweet, overgrown here and there by stunted willows, young aspens and blackberry bushes, except, of course, in the grassy part of the meadow—a wide choice of food plant, in the absence of direct observation.

On August 15, 4 more were secured, one macropterous, 3 brachypterous. The species, however, appears to be shade-loving, as it was under bushes or other shady spots. On the 17th, 6 more were taken, one long-winged. My field notes say: "it *seems* to occur in the low growth (rosettes) of a white aster—*but,* I also swept it in the open field from mixed growth! Very indefinite!" Again, 4 brachypterous were found under the same conditions. The field note: "The only fairly certain things about the habitat is that they are found more or less in the shade of trees and bushes, since they seem preferably swept along the edges of footpaths or of the mowed areas where the grasses are again tall."

Another single specimen was found on August 23; and on September 5, five more semibrachypterous. The conditions under which they were found were closely noted; they bore out what is set forth above. The last of the season was taken on Sept. 6, one only, although collecting was continued in the same spot to the 17th of the month.

In the summer of 1933, on June 10 and again on July 7, I thoroughly swept the area where *Hesperotingis* had been found the year before, but without result. On July 27, the first four adults of the season were taken, two macropterous, in about ten minutes—then nothing. Half an hour's sweeping on the 29th yielded only one short-winged. The same spot was gone over on August 26 and 3 brachypterous were taken, and another one on the 29th; the last collecting of the season on September 2 yielded one more.

In 1934, success was small. Not one was found until July 30, when one macropterous was swept; on August 4, one macropterous and 3 brachypterous; on August 10, another four, one of them macropterous. The last collecting of the summer of 1934, on Sept. 1, did not yield a single specimen.

In these three summers, 48 specimens were secured, of which 11 were macropterous (about 30%). The earliest date on which Heperotingis was found was July, 1932; and the latest, September 6 of the same year. The greater part of the specimens was taken either on a footpath about 50 feet long, through bushes; or else along the edges of a tree-grown space not over 100 feet long. The species was sought for in other parts of the field, but without success, except in one instance. It was never found in or among tall grasses.

THE DIPTERIST.

Dedicated to Dr. A. L. Melander.

His face is bronzed by desert alchemy,
His hands are supple, deft and very strong,
As down the trail he blithely moves along,
There is no moving thing he does not see,
He notes the praying mantis and the bee
And marks the hid cicada by his song,
His estimate is almost never wrong,
On questions of a fly's identity.
A dipterist is rarely ever bored,
With many interesting things to do,
Collecting days are always underscored
And strange enough, they're always far too few.
A dipterist's a man who mostly sighs,
Because the Lord was stingy with the flies.

Written May 13, 1945,
by John L. Sperry,
Riverside, California.

THE FAMILY NAME OF ANTHRIBIDAE (COLEOPTERA), THE IDENTITY OF AMBLYCERUS THUNBERG, AND THE TAXONOMIC POSITION OF EUSPHYRUS LE CONTE.

By J. Chester Bradley, Ithaca, N. Y.

Anthribus Geoffroy.

Geoffroy, a binary but not binominal author, described *Anthribus* in 1762 and included 7 polynomial species. The name of only one of these, the 4th, was accompanied by a bibliographical reference to a previously used name. Pierce (Proc. U. S. Nat. Mus., 1916 and 1930, vol. 77, art. 17, p. 2–3) concluded that therefore only this species is available as type of the genus, and that since it is a dermestid beetle, the generic name *Anthribus,* type of Anthribidae, passes out of the Rhynchophora. In this conclusion Pierce was in error. He was correct in accepting *Anthribus* Geoffroy 1762 as a valid name, for the case is exactly similar to that of Gronow covered in Opinion 20.[1] But it is apparent from Opinion 23 that any of the species described by Geoffroy, if identifiable with a uninominally named species, or subsequently given a uninominal name, is available as genotype.

Geoffroy's species no. 1, 2, and 3 were all identified by Fabricius in the Ent. Syst., 1792, vol. 1, p. 376, and are respectively 1) *scabrosus* F., 2) *varius* F., 3) *latirostris* F., all three included in *Anthribus* by Fabricius; all of them, along with no. 4 (for which Geoffroy cited a Linnean reference) and equally with any of the others, if identifiable, were available as genotypes. The genotype was definitely fixed by Latreille 1810, as *latirostris* F., which is Geoffroy's third species. This species was also validly designated type of *Platyrhinus* Schellenburg by Schoenherr, 1826, so that the two genera are isogenotypic synonyms. The name *Anthribus* can thus be restored as type of the family Anthribidae in the accustomed usage of that family name, and it will also fall within the same subfamily as the genus to which the name *Anthribus* has ordinarily been applied. The customary application of the name *Anthribus* has followed the usage of Schoenherr, who incorrectly designated the first species included by Fabricius, namely *albidus,* as type, disregarding the prior designation of Latreille.

---

[1] The matter of binary nomenclature is again under discussion in the International Commission on Zoological Nomenclature, but we cannot anticipate a reversal of their Opinions.

Amblycerus Thunberg.

In his *De coleopteris rostratis,* Nov. acta Reg. soc. sci. Upsaliensis, 1815, 7: 104–125, Thunberg gave a key to the genera of Rhynchophora, published a description of each, and listed certain species "inter alias numerosos species" which belong to each genus. In doing this he listed (a) well-known species, without mentioning the author and without description and (b) new species which he described. It is clear that those species which can be identified in the literature of the period, taking into account the generic characters enumerated by Thunberg, are available as genotypes.

Crotch (Trans. Ent. Soc. London, 1870, p. 227) named *nebulosus* as the type of *Amblycerus,* and this having been an included species, was a valid type-designation.

Bridwell (Proc. U. S. Nat. Mus. 1930, art. 17, p. 29, footnote) has written "It is impossible to accept the designation of Crotch (1870) of *Amblycerus nebulosus* Thunberg, 1815, as genotype of *Amblycerus* because of insufficient bibliographical indication to determine the identity of that species which . . . might refer to *Anthribus nebulosus* Forster (1771), *Bruchus nebulosus* Olivier (1795) or *Macrocephalus nebulosus* Olivier (1795)." Bridwell thereupon designated *robiniae* type. *Robiniae* was also one of the well-known species included in *Amblycerus* by Thunberg without bibliographical citation or description or even name of the author. It might apply to *Bruchus robiniae* Fabr., 1781, to *Curculio robiniae* Hbst., 1795 (which later became type of *Cycloderes* and which Schoenherr invalidly designated type of *Thylacites*) or *Bruchus robiniae* Ol. 1795 of which *robiniae* F. was cited as a synonym, but which is now treated as another species.

But Crotch designated *nebulosus* type, and the question arises, can that species be rejected and another in equal position substituted? It is necessary more closely to examine the three forms that might have been meant by *nebulosus,* and see whether it really cannot be determined which Thunberg had in mind.

Thunberg says of *Amblycerus* and *Anthribus* "Antennis perfoliatis," of *Amblycerus* "Antennae articulis infimis aequalibus; clava triarticulata," of *Anthribus* "Antennae perfoliatae; octo articulis globosis aequalibus; clava ovata, acuta, triarticulata."

Olivier says of *Bruchus* "Antennes filiformes presque en scie . . . les sept derniers presque en scie" of *Anthribus* "Antennes . . . en masse, . . . les quatre derniers en masse perfoliée."

Of *Bruchus nebulosus* Olivier says "Antennae serratae." It is thus very clear that it is excluded from Thunberg's genus *Amblycerus.*

Anthribus nebulosus Forster is a well-known north European species (described from England) specimens of which are before me, as they certainly were before Thunberg, so that it is not necessary to rely solely upon Forster's rather scanty description. *Macrocephalus nebulosus,* adequately figured by Olivier, is a South American species that there is no occasion to suppose Thunberg would have had before him. So far as antennae are concerned, both might have come under Thunberg's genus. But not so in regard to the thorax. Thunberg says of *Amblycerus* "Thorax convexus, aequalis, postice sinuato-triangularis," of *Anthribus* (of which, as at that time used, *Macrocephalus* was a synonym) "thorax planiusculus, antice angustior."

The convex, posteriorly bisinuate, triangular pronotum is an obvious character of *nebulosus* Forster. Olivier's figure shows nothing of the sort for his South American *Macrocephalus,* and as to its thorax being convex, Olivier says "le corcelet est déprimé."

It seems therefore very clear that Thunberg could *only* have meant the well-known palearctic *nebulosus* Forster, now put in the genus *Brachytarsus.*

Of the 8 original species of *Amblycerus,* 3 (counting *nebulosus*) are members of the genus *Brachytarsus,* the fifth, synonymous with the genotype, having been used by Schoenherr in 1823 as type in erecting that genus, and 6 of the 8 are clearly Anthribidae. Billberg (a contributor to the same volume in which *Amblycerus* was described, and who may be assumed to have been in touch with Thunberg's work) five years after *Amblycerus* was published, in cataloguing his collection, listed both *Macrocephalus* Oliv. and *"Antribus"* auct. citing *"Amblycerus* Thunb." as a synonym of the latter. In it he mentioned only 2 species, Thunberg's 4th and 5th, *"scabrosus* F. and *varius* F." both now *Brachytarsus.*

It seems necessary therefore to let the designation by Crotch of *nebulosus* as type of *Amblycerus* stand, and to use the name instead of *Brachytarsus,* as should have been done when Crotch designated the type.

Even if the identity of *nebulosus* could not be clarified the fact remains that it was designated type, and type it must remain. There is no procedure provided under the International Code of Zoological Nomenclature that permits Mr. Bridwell to set the designation aside and to substitute a species of his own choosing. The identity of *nebulosus* seems to me entirely clear but if the species were hopelessly unindentifiable it would still be type, and *Amblycerus* would become an unrecognizable genus. In no event can it be identified with *Spermophagus* auct. in the Mylabridae, as has been reaffirmed by Bridwell within the past month (Journ. Washington Acad. of Sci., Febr. 1946, 36: 53).

THE TRIBAL POSITION OF EUSPHYRUS LECONTE.

Pierce (Proc. U. S. N. Mus., 1930, v. 77, art. 17, p. 22) has removed *Eusphyrus* from the proximity of *Ormiscus,* and allocated it in his new tribe Platystomini. Nevertheless, its relations are with *Ormiscus,* to the vicinity of which it should be returned, in Pierce's tribe Phaenithonini, if that tribe be recognized. It is true that it approximates the Platystomini in having the surface of the pronotum behind the ridge short and nearly vertical, but in this is only a step beyond *Toxotropis.* It agrees closely with *Ormiscus* and *Toxotropis* in its emarginate eyes, and in having the pronotal carina turning down and not at all forwards at the sides, thus terminating in a little lobe or wing; in these and other respects it is unlike the Platystomini, with which it seems to have no really close association.

Prey Records of Gorytine Wasps (Hymenoptera, Sphecidae).—Although it is well known that Gorytine wasps generally provision their nests with Homoptera, there are relatively few records of the prey of the North American species. The following notes may thus be of interest.

Ochleroptera bipunctata (Say) [olim *Gorytes* seu *Paramellinus bipunctatus* Say] :—Ithaca, N. Y., July 19, 1936; with the Cercopid, *Philaenus lineatus* (L.).

Gorytes atricornis Packard:—Ithaca, N. Y., June 27, 1936; with the Membracid, *Cyrtolobus tuberosus* (Fairmaire).

Hoplisoides nebulosus (Packard) :—Moose P. O., Jackson Hole, Wyoming, elevation 6600 ft., July 19, 1929; an immature Membracid, probably of the genus *Palonica* Ball.

Hoplisoides spilopterus (Handlirsch) :—Wenatchee, Washington, July 5; with the Membracid, *Stictocephala wickhami* Van Duzee.

Psammaletes pechumani Pate:—northern Virginia; with the Fulgorid, *Ormenoides venusta* (Melichar).

I am indebted to Dr. J. S. Caldwell for the identification of the Homoptera.—V. S. L. PATE, Ithaca, New York.

DERAEOCORIS BREVIS FEEDING OBSERVATIONS.

By George F. Knowlton, Utah State Agricultural College, Logan, Utah.

A small, blackish bug, *Deraeocoris brevis* Uhler, was observed to be feeding on an *Erythroneura* nymph on Virginia creeper at Logan, on the Utah State Agricultural College Campus, August 23, 1933. Examination showed the creeper foliage to be heavily infested and being seriously damaged by the leafhoppers, *Erythroneura ziczac* Walsh, and nymphs. *Deraeocoris brevis* also was present in moderate abundance.

One of the predators was brought into the laboratory and placed in a two-dram homeopathic vial with 8 nymphs of *E. ziczac* and kept under constant observation under a wide-field binocular microscope. Within five minutes the predator had captured a fifth-instar nymph, the prey being seized by means of the prothoracic tarsi of the predator. The feeding stylets than were inserted through the dorsolateral suture between the head and prothorax of the nymph. After four minutes of feeding the mouth parts were withdrawn and re-inserted through the left wing-pad. The predator stylets next were inserted into the left side of the nymphal leafhopper's head on the dorsal side. After feeding at this point for five minutes the nymph had the appearance of being partially translucent, as though air was taking the place of the normal body fluids. For two minutes the predator probed about, inserting its stylets into various parts of the victim's body, each time withdrawing these structures after a few seconds.

At this point a second *ziczac* nymph walked near the predator. This nymph was quickly seized by the prothoracic tarsi of the predator which soon was feeding through a puncture made at the apex of the nymphal head. After six minutes of feeding at this point, the leafhopper nymph was discarded and a third nymph captured and fed upon for three minutes, through a puncture on the dorsum of the victim's abdomen. At this time the feeding process shifted to the dorsum of the mesothorax where it continued for nine minutes. The next feeding was conducted for four minutes at the inner margin of the right eye. Using its prothoracic tarsi, the *Deraeocoris brevis* would shift its prey for changes in feeding position, which during a period of five minutes occurred through the right wing pad, thorax, then the abdomen.

After one minute of rest the predator quickly grasped a fourth large nymphal victim, feeding through a ventral puncture at the suture between metathorax and abdomen. After feeding in this position for seven minutes the predator probed around restlessly, then fed for eleven minutes through a puncture in the left wing pad, until the body of the nymph had a bluish, translucent appearance under the microscope. After three minutes of restless probing about and short time feeding, the body of the prey was discarded. A fifth *Erythroneura* nymph was seized within a few seconds and fed upon for nine minutes: this victim then was discarded. Observations were discontinued at this time, the single mirid predator, *Deraeocoris brevis,* having fed on and killed five large *Erythroneura ziczac* nymphs within total elapsed time of one and one-half hours. When abundant, this species evidently is an important predator of *Erythroneura ziczac.*

An adult *Deraeocoris brevis* was observed to feed on a nymphal aphid, *Prociphilus fraxinifolia* (Riley), in heavily infested rolled leaf of ash tree at Smithfield; another fed on a winged *Eriosoma americana* Riley at Hyrum, in Utah.

A Minute on Ampulex Jurine, 1807 (Hymenoptera, Sphecidae).—In my catalogue of the generic names of the Sphecoid wasps, I stated (1937, Mem. Amer. Ent. Soc., no. 9, p. 7) that Shuckard in 1837 (Essay Indig. Fossor. Hymen., p. 18) fixed the common European species *Ampulex fasciata* Jurine, 1807, type of the generic name *Ampulex* Jurine, 1807. Recently, however, I have discovered that Audouin fifteen years earlier (1822, Dict. Class. Hist. Nat., I, p. 301) validly designated *Chlorion compressum* F. [i.e., *Sphex compressa* Fabricius, 1781 = *Ampulex* (*Ampulex*) *compressa* (Fabricius)] type of *Ampulex* Jurine. *Lorrheum* Leach, 1837 and *Chlorampulex* Saussure, 1892 also have the same genotypic species and must therefore be recorded as absolute synonyms of Jurine's name.—V. S. L. Pate, Ithaca, N. Y.

A NEW TORTOISE BEETLE FROM TEXAS (COLEOPTERA, CASSIDINAE).

By H. S. Barber, Bureau of Entomology and Plant Quarantine,
Washington, D. C.

In 1901 Spaeth (Zool.-Bot. Gesell. Wien, Verhandl. 51: 346) established the generic names *Orectis* for *Cassida rugosa* Boh., 1854, of Mexico and *Parorectis* for *Cassida callosa* Boh., 1854, of Texas. The types of both generic names are thus automatically fixed, and since *Parorectis* was proposed as a subgenus of *Orectis* no question of precedence remained when he disregarded these subgeneric distinctions in his 1914 catalog. From this catalog the first name was adopted for use in our records (Barber, 1916; Leng, 1920), but samples have been very infrequently received by the Bureau of Entomology and Plant Quarantine and much remains to be learned. A pale form collected at Carrizo Springs, Texas, by Harrison, in the course of a special survey conducted by the Bureau of Entomology and Plant Quarantine in the vicinity of ports of entry, attracts attention by the almost total suppression of the elytral tubercles and infuscate markings, so that it was mistaken for *Gratiana pallidula.* The five specimens were found on leaves of string bean, but this was noted by the collector as "probably accidental," and since samples of *O. callosa* have been found breeding on *Physalis* or feeding on *Solanum* it is surmised that a similar host association will be proven normal for the new form. Samples of *callosa* are from several localities in Texas, Florida, and South Carolina. The apparent scarcity of the latter species is probably due to collectors' neglect of the host plant, and perhaps also to its being mistaken for small-sized individuals of the rough-backed tortoise beetles of potato or eggplant, *Plagiometriona clavata* in the East and *P. diversicollis* in the Southwest; but in the latter genus the claws are broadened at base into a large lamelliform tooth, and the prothoracic carina surrounding the retracted head is not abruptly interrupted behind the eye to receive the retracted antenna. In *Orectis* the claws appear simple, but under sufficient magnification a finely crenulate carina on each side of the under surface becomes visible.

Orectis sublaevis, n. sp.

Broadly oval, pale brown without dark markings, the last two antennal segments infuscate; surface shining and smooth except for the very coarse strial punctures on the elytra, these punctures unevenly spaced due to vestiges of the obsolescent tubercles occupying the same relative positions as the prominent ones in *O. callosa*. Pronotal disc as in *callosa* but without the pair of round infuscate spots near the scutellum, the disc convex, a small transverse prescutellar depression and large rounded ill-defined depressions over the eyes and near the hind angles. Basal margin of elytra strongly crenulate from the scutellum to opposite the hind angles of the pronotum. Length 5.2–5.5 mm., width 4.0–4.2 mm.

Type locality.—Carrizo Springs, Tex.

Type and four paratypes. United States National Museum No. 57962. Another paratype in the collection of the Ohio State University is labeled, "Davis Mts. Tex. VII. 9, J. W. Green, W. H. Wenzel Collection."

Minute Pirate Bug Notes.—An *Anthocoris musculus* (Say) was observed while feeding on a male aphid, *Clavigerus smithiae* (Monell), on a willow twig at Riverdale, Weber County, Utah, on October 3, 1942. The writer has also collected *musculus* at American Fork, July 25, 1940, Ogden, October 3, 1942, and in Logan Canyon, in Utah.

Anthocoris melanocerus Reuter was observed to feed on a pea aphid, *Macrosiphum pisi* (Kalt.), in an aphid-infested alfalfa field at Moab, Utah, June 26, 1943, near willows and poplars. Predacious insects were abundant in this field, 162 pea aphids, 2 *A. melanocerus,* a convergent ladybird beetle, 3 *Nabis alternatus* Parsh, 2 predacious *Collops* beetles, 3 *Orius tristicolor* (White), 1 adult and 2 larval Chrysopidae were taken in 5 sweeps of the insect net. *A. melanocerus* also has been collected at Logan, July 22, 1940, Wallsburg, Provo, Altamount and Beaver Canyon, in Utah; also Logan Canyon, Utah, July 20, 1940 (Knowlton-D. G. Hall); Liberty Canyon, Utah, July 5, 1940 (Knowlton-F. C. Harmston); feeding on the aphid *Periphyllus americanus* Baker on Sycamore maple at Logan, Utah, October 1, 1941; feeding on *Eriosoma americana* (Riley) at Hyrum, Utah, June 1942; abundant in leaves folded by *Thecabius populi-conduplifolius* (Cowen) at Naples, Utah, July 25, 1945. At Maeser in Uintah Basin, one was found to be feeding on a small pear-shaped aphid, *Pseudoepameibaphis glauca* G.-P. which was numerous on sage, beneath a large poplar tree which was heavily infested with *Pemphigus* aphids and their galls.

Anthocoris antevolens White was collected at Logan, Utah, June 21, 1941.—G. F. Knowlton, Utah State Agricultural College, Logan, Utah.

EXCHANGES AND FOR SALE.

This page is limited to exchange notices and to small For Sale advertisements from members of the Society and from actual paid subscribers to the Bulletin exclusively. *Exchange notices* from members of the Society and from subscribers are limited to *three (3) lines each,* including address; beyond 3 lines, there will be a charge of $1.00 for each 3 lines or less additional. *For Sale* ads will be charged at $1.25 for each 3 lines or part of 3 lines. *Commercial or business* advertisements will not be carried in this page, but will go in our regular advertising pages at our regular advertising rates to *everybody.*

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BULLETIN

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AN ENTOMOLOGIST IN NEW GUINEA.

By Jacques R. Helfer, Mendocino, California.

We landed at Oro Bay, Papuan New Guinea, splashing ashore through the surf from our LCV type landing craft which had run aground a short distance from shore. There was a sandy beach stretching for miles in either direction; overhead the sun beat down fiercely against our steel helmets; ahead was a neglected coconut grove, overgrown with brush, extending as far as the eye could see, up and down the coast. This narrow strand, separating the jungle from the sea was to typify every place we were to land in New Guinea, and often there were swamps beyond the first line of trees, and always there were the myriads of biting flies.

Our first task was to clear a space and render it habitable. Armed with machetes and liberally smeared with insect repellent we went to work. I know of no better way of becoming acquainted with the flora of a new territory than by chopping through a tangled thicket with a machete. One is made painfully aware of the presence of novel spined vines and barbed bushes, and trees growing from tall pyramids of roots, their trunks never reaching the ground. One comes face to face unexpectedly with large beady-eyed spiders, but these are not as bad as the ants. There is a species of very anti-social red ant, 12 mm. in length which I must warn anyone against who plans to collect in New Guinea. It constructs its waterproof clubhouses by webbing together the living leaves of a shrub into hollow chambers the size of cantaloupes. A machete would crash into one of these structures and immediately the hapless woodsman would be covered with the aggressive hard biting ants. I highly recommend the manoeuvre humorously referred to as "stragetic withdrawal" to anyone finding himself the object of a concerted attack by these creatures. There is no standing and fighting them. At night it was necessary to sleep under mosquito bars to protect against malaria and elephantiasis. In walking

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through the kunai grass during the day it was necessary to apply insect repellent liberally over the lower extremities to prevent bites from a tiny red mite, vector of the deadly scrub typhus. To remove one's shirt was to invite the bite of the tiny white and black sand-fly, resulting in an ugly red itching welt.

But thus far I have spoken of the Arthropods which one meets the hard way, which, in their singularly direct way "catch the entomologist," so to speak. It is a welcome relief to issue forth from one's tent, armed with alcohol vials, and to go in search of the less well known insects which, when approached, flee from the entomologist instead of attacking him in concert as fair game. It always offended my sense of propriety to feel a biting fly sink his proboscis into my neck just as I was reaching over to pick a beetle off a leaf. They have absolutely no sense of the fitness of things!

Two things become strikingly apparent when one goes collecting in the New Guinea jungles. First, although he roll over stones and logs for hours, the collector will seldom find anything in the muddy wetness beneath. Carabidae are very uncommon, their duties being taken over by very active foliage-running Cicindelidae and swift flying Staphylinidae. And second is the remarkable absence of insects in the flowers which one sees blooming all around. Even the tree orchids, blooming in festoons, high above the jungle floor, attract no insects to speak of. The wild Cockscomb, however, attracted some pretty little Scarabaeidae in March and April, and a sort of Morning Glory, sinking its roots deep into the sand on the seaward edge of the jungle, attracted a little bluish Eucnemid to its pinkish flowers, making the second and last notable exception to the generally sterile hunting grounds provided by the jungle flowers.

Chrysomelidae and Rhyncophorinae have reached a high degree of specialization and are numerous everywhere, from the first fringe of vegetation at the edge of the beach to the high mountains a few miles back, excepting in the swamps.

Many of the Coleoptera are found only on specific food plants and it is easy to get into the habit of ignoring all but a few very productive types of plants in collecting. This is a mistake as repeated careful examination of previously unproductive shrubs over a period of time will often turn up seasonal forms which would otherwise be completely overlooked. Some plants, however, are never very productive, to be sure.

Although the absence of coniferous trees, oaks, willows, and the other familiar groups of trees of our countryside was painfully evident, I was, nevertheless, struck at once by the similarity of many of the New Guinea plant forms to our own natives. There was, for example, a shrub having leaves very similar in outline and texture to our Thimble Berry. Wherever I encountered this shrub I found *Trachys* (Buprestidae) abundantly, chewing little holes in the leaves, but very few other insects. There was a small shrub which I couldn't have distinguished from our Hazel Nut excepting that it had no nuts. *Trachys* fed upon its leaves occasionally, but very few other insects were attracted to it. Sword Ferns, indistinguishable to me from our own, grew everywhere in shady situations. The diminutive members of the genus *Endelus* (Buprestidae) fed upon the leaves of these ferns, gnawing tiny holes like the work of flea beetles. In the Philippines, on Leyte Island, I also found *Endelus* abundantly on sword-type ferns and nowhere else. Morning Glory grew everywhere in the half sunlight and was fed upon by various Tortoise Beetles and Chrysomelidae, the former always feeding on the under side of the leaf. On Leyte Island, Morning Glory leaves were often chewed to ragged shreds by two species of *Trachys* (each one keeping to its particular kind of Morning Glory). One of the New Guinea shrubs resembles closely the shiny leafed tree-shrub commonly called Greasewood in Northern California, and was the specific host to a species of *Melobasis* (Buprestidae). Giant Magnolias, growing in the outer fringe of jungle, seemed to be the host to the large Cetoninae. Many of the plant forms are strange to dwellers in temperate climates, and one must learn them without the advantage of being able to call them by the name of their equivalents in our flora.

Staphylinidae occurred in rotten Breadfruits under the Breadfruit Trees, in the fermenting sap of Coconut logs and stumps, and in all sorts of refuse, in company with Nitidulidae, a few Histeridae, and Scarabaeidae. Weevils were attracted in good numbers to fermenting sap of various kinds of palms.

On Biak Island, in the Schoutens, where generally the same collecting conditions prevail as elsewhere in the New Guinea region, I found Staphylinidae and *Chrysobothris* (Buprestidae) being attracted in considerable numbers to the drums of fermenting mash at a still located in a coppice of mixed growth with Banyan and Hibiscus very plentiful.

The swamps are inhabited by a few foliage running Cicindelidae and some large *Xantholinini* (Staphylinidae) and little else. *Anopheles* is ambushed there, however, with plenty of her thirsty sisters.

The large Dynastids and Cetonids (Scarabaeidae) are nowhere plentiful. The former fly to lights occasionally, with many smaller Scarabaeidae and other beetles, but usually are noticed walking about over the ground. The Cetonids, big green and red and black and blue bizarrely marked beetles, are very curious, flying down to within two or three feet of the collector's face and then hovering there, dodging every sweep of the hat, until, tiring of the sport at last, they fly off like humming birds through the trees. I regret to say that my composure was invariably severely ruffled by these performances and that the Cetonid's departure was always marked by interludes of vilification. But it is possible to capture a small number of these in the early mornings when they are sometimes seen resting sluggishly on foliage. One day a dump containing 622 Bangalore Torpedos exploded, blasting a great crater. The next day all around the crater I found beetles which, apparently shaken up by the blast, had climbed up onto everything available and were recuperating in the sunshine.

There were many species of beetles inhabiting the fungus growths which were very plentiful on logs and dead trees. One little blue species came out from under the bark where it lived in the early morning just after a rain, and was easily taken in numbers on the Coconut stumps.

Shield Bugs (Hemiptera) were plentiful at times on the foliage of particular trees and on Hibiscus and are very offensive smelling when handled, which contrasts sharply with the beauty of their metallic coloration.

Lampyridae were easily taken at night by watching in moist areas for their flashes.

Cicindela species occurred on sandy flats, on earth sides of gullies, along roads and the banks of streams, very much as they do in America.

Sifting of litter produced a disappointingly few specimens, mostly small Staphylinidae.

The persistent association of Buprestidae with Banyan trees suggests that this tree is the host of many Buprestid species. *Belionota, Chrysobothris,* and *Cyphogastra* in company with *Agrilus* frequented the trunks of felled trees, *Agrilus, Sambus,* and *Melobasis* occurring on the foliage, especially where it was sprouting from stumps. Most *Agrilus,* however, were found actively flying about from leaf to leaf of mixed growths of low brush, especially bordering trails, streams, or along margins of the jungle.

It was a general rule that collecting was better along the edges of the jungle, although many forms would be missed by a failure to search through the dense portions of the jungle. Buprestidae, especially, were most plentiful in the sunshine or where thin overhead foliage made a pattern of light and shade. Coccinellidae and Cerambycidae were taken in similar situations, the former on foliage, the latter more often on woody parts of trees or shrubs, just as one would expect to find them in America. One species of Cerambycidae was common in the centers of a pineapple-like plant, where it could be taken from its hiding places among the leaf-bases by breaking down the leaves with the feet.

Many species of Lepidoptera were fairly abundant in open jungle and in open areas. The giant *Ornithoptera* are plentiful but have the exasperating habit of flying high overhead among the great trees, far out of reach. Occasionally they are found flying low around Hibiscus clumps and around the purple flowers of the Pleronas and the dainty Rock Roses where they can be taken with the hand from the flowers.

Scorpions were nowhere plentiful and I was never able to find the large red-tailed species which our Army Handbook carefully warned us against, try as I might! A few small species lived under loose bark of trees and among the bases of leaf-branches of palms.

Lucanidae were uncommon, a few specimens turning up on trees or accidentally around camp.

There was always a coastal track just inside the outer fringe of jungle, wherever we went, the highway of the natives, leading ever onward and a convenient route to follow when collecting in strange country to keep from getting lost. The gardens of the natives are often encountered if one follows the little side trails leading back into the jungle, and these are often very productive of species which are not encountered elsewhere.

In conclusion I would like to say that in the jungles of New Guinea, where I collected over a period of sixteen months, at eleven different localities, just as in America, the collector must work hard and with ingenuity if he would take many interesting Coleoptera. They are not to be scraped into the collecting jar by handsfull. The large bizarre species of Coleoptera are not plentiful. As in America, many of the insects are seasonal and many are consistently associated with particular food plants.

THE SUBGENERA CRASPEDOCHAETA AND ACROSTILPNA IN NORTH AMERICA, GENUS HYLEMYIA SENS. LAT. (DIPTERA, MUSCIDAE).

By H. C. Huckett, Riverhead, New York.

The present paper deals with two segregates within the genus *Hylemyia sens. lat.,* whose general habitus is exemplified respectively in the species *Hylemyia pullula* and *Hylemyia latipennis* of Zetterstedt. Ringdahl (1929)[1] in studying the Swedish fauna has proposed the names *Melinia* and *Acrostilpna* for the segregates, and has included them in a key to allied groups in which some or all of the species are known to possess a bristle or spur at apex of posteroventral surface of hind tibia. In my opinion it is doubtful whether the name *Melinia* can be maintained in view of the claims of *Craspedochaeta* Macquart (1850) for recognition.

Craspedochaeta Macquart

Craspedochaeta Macquart, Dipt. exot., Suppl. 4, p. 241 (1850).
Melinia Ringdahl, Ent. Tidskr., LI: 270 (1929).—Tiensuu, Ann. Ent. Fenn., IV (1): 26 (1938).—Collin, Ent. Month. Mag., LXXV: 146 (1939).

Genotype: *Anthomyia punctipennis* Wiedemann (by original designation).

The genus *Craspedochaeta* was proposed by Macquart (1850) for the reception of the South American species *Anthomyia punctipennis* Wiedemann. The generic description was based on the female sex, which, among other characters, was described and illustrated as possessing two hooklike setae (*crochets*) at caudal extremity of ovipositor. This seeming discrepancy in the text and drawing was stated by Stein,[2,3] who had examined Wiedemann's type in the Vienna Museum, as being probably due to Macquart's error in mistaking the anal appendages (palpi) for such structures, and not apparently, to any mistake on Macquart's part in identifying the species.

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[1] Reference to literature cited in the synonymies is signified by date of publication.

[2] Stein, P. 1904. Die Amerikanischen Anthomyiden. Annales Musei Nationalis Hungarici, II: 480.

[3] Stein, P. 1907. Revision der Bigot'schen und einiger von Macquart beschriebenen aussereuropäischen Anthomyiden. (Dipt.). Zeitschr. f. Hymen. u. Dipt., VII (4): 285.

The subgenus *Melinia* was proposed by Ringdahl (1929) for the reception of four European species, of which *Aricia pullula* Zetterstedt was chosen as the type. This species, in my opinion, is congeneric with *Anthomyia punctipennis* Wiedemann, the type of *Craspedochaeta,* and hence the name *Melinia* for the group falls as a synonym owing to the prior claims of *Craspedochaeta.*

Malloch[4] in his study of the Diptera of Patagonia and South Chile disclosed that he was treating of many species under the genus *Hylemyia* that properly belonged to Macquart's *Craspedochaeta.* A comparison of the illustrations of the male copulatory appendages there presented with those of *pullula* (Schnabl and Dziedzicki, 1911) and *karli* (Ringdahl, 1929) strongly indicates that these species possess a common kinship. This deduction has been confirmed by an examination of a number of specimens from North and South America belonging to the group. The neotropical species evidently reach their northern limits of distribution in the Southwestern region of the United States, being represented there by *Hylemyia ochripes* (Thomson).

> Subgeneric characters.—Head with fascial bands on parafacials near base of antennae and not unusually on buccal area; postocular setulae in both sexes mostly short and stiffish; male with a pair of minute orbital setulae adjacent anterior ocellus; female with caudal pair of ocellar bristles longish and directed outwards; mesopleura with a single seta dorsad of upper long bristle of mesopleural series, well developed but not long, and with a bristlelike seta on upper border adjacent anterior notopleural bristle; stigmatal bristles (below mesopleural spiracle) with only one or two accessory setulae at base; sternopleurals arranged 2: 2; mid tibia with two posterodorsal bristles, hind tibia with a short bristle or spur at apex of posteroventral surface; male with copulatory processes and genitalic appendages typical of *pullula,* the former as pendant flat horny plates devoid of outer bristles, and typically terminating in a lobelike extension directed caudad, gonostyli (inferior forceps) notched apicad and armed on inner surface with spinulose setae (figs. 4–9); basal sclerite of hypopygium in North American species shining black except in *ochripes.*

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[4] Malloch, J. R. 1934. Diptera of Patagonia and South Chile. Pt. VII, Fasc. 2, Muscidae. British Museum (Natural History), p. 179–187.

KEY TO SPECIES.

1. Clouding of *m-cu* crossvein restricted to dotlike marks near or at union of crossvein and longitudinal veins; abdomen with a dorsocentral vitta and paired lateral marks on terga 3 and 4; male with basal sclerite of hypopygium grayish pruinescent .... *ochripes* (Thoms.)

   Clouding of *m-cu* crossvein continuous and subparallel, or absent; abdomen with only a dorsocentral mark on terga 3 and 4; basal sclerite of hypopygium in male black and lustrous 2

2. All femora largely or entirely blackish; in female mid and hind femora occasionally pale seal brown 3

   Mid and hind femora reddish or yellowish, sometimes more or less tinged with infuscation 4

3. *R-m* and *m-cu* crossveins clouded; fore tibia usually with one medial posteroventral bristle; male with scutellum pale gray; female devoid of bristlelike setae on discal surface of tergum 5 .... *pullula* (Zett.)

   R-m and *m-cu* crossveins not clouded; fore tibia usually with two medial posteroventral bristles; male with scutellum blackish; female with erect bristlelike setae on discal surface of tergum 5 .... *mimetica* (Mall.)

4. *R-m* and *m-cu* crossveins broadly clouded; abdominal dorsocentral vitta composed of a series of subtriangular marks; in male the bristles on median third of anteroventral surface of hind femur usually stouter developed than those distad, in female the frontal vitta reddish cephalad at base of antennae .... *facialis* (Mall.)

   R-m and *m-cu* crossveins not broadly clouded; abdominal dorsocentral vitta linear in outline; male with bristles on medial third of anteroventral surface of hind femur shorter than those distad; female with frontal vitta entirely grayish black .... **nigriceps** n. sp.

Hylemyia (*Craspedochaeta*) *ochripes* (Thomson)

Anthomyia ochripes Thomson, Dipt. Eug. Resa, p. 553 (1868).—Aldrich, Misc. Coll. Smithsn. Inst., XLVI: 549 (1905).

Hylemyia ochripes Stein, Wien. Ent. Zeitg., XXIX: 70 (1910).—Séguy, Gen. Insect., Fasc. 205, p. 105 (1937).

Arizona: ♀, Baboquivari Mt., VII.19.32 (R. H. Beamer). [Univ. Kans.]

California: ♂, San Mateo (Baker), lectoallotype. [U.S.N.M.] ♀, Whittier Hills, II.19.32 (C. H. Martin). ♀, Stinson Beach, VI.11–15.38 (R. H. Beamer). [Univ. Kans.]

The species *ochripes* is cited by Stein[5] as a synonym of *Chortophila limbinervis* Macquart. I have preferred to regard the two species as distinct. In my opinion *ochripes* differs from *limbinervis* in the form of the clouding of *m-cu* crossvein. In the former species the marking is divided into two dotlike areas, whereas in *limbinervis* the clouding is continuous and subparallel with the crossvein. In the female of *ochripes* the mid and hind femora are yellowish and not largely blackish as in *limbinervis.* Both species lack the fuscous mark (stigma) at opening of cell *Sc.,* as is present in *punctipennis* (Wied.).

Hylemyia (*Craspedochaeta*) *pullula* (Zetterstedt)

Aricia pullula Zetterstedt, Dipt. Scand., IV: 1449 (1845).

Anthomyia pullula Schiner, Faun. Austr., I: 650 (1862).

Hylemyia pullula Rondani, Dell. Soc. Ital. Scienz. Natural., IX: 109 (1866).—Stein, Ann. Mus. Nat. Hungar., XVI: 237 (1918).—Stein, Arch. f. Naturgesch. (1918), LXXXIV A (9): 83 (1920).—Séguy, Gen. Insect., Fasc. 205, p. 109 (1937).—Van Emden, Bull. Ent. Res., XXXII: 264, 267 (1941).

Pegomyia (*Anthomyia*) *pullula* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV (2): 111 (1911).

Chortophila (*Egeria*) *pullula* Karl, Tierwelt Deutschlands, XIII: 150 (1928).

Hylemyia (*Melinia*) *pullula* Ringdahl, Ent. Tidskr., LI: 270 (1929).—Ringdahl, Opus. entom., IV: 151 (1939).—Ringdahl, Tromsø Museums Årshefter (1942) LXV: 5 (1943).

Melinia pullula Collin, Jour. Soc. Brit. Ent., I, Pt. 1, p. 22 (1934).

Alaska: ♂, Healy, VI.24.21 (J. M. Aldrich). [U.S.N.M.]

Alberta: ♂, Edmonton, V.27.37 (Strickland), ♂, Cooking Lake, V.24.37 (F. O. Morrison), ♂, Calgary, VI.3.39 (W. S. McLeod). [Univ. Alberta.]

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[5] Stein, P. 1919. Die Anthomyidengattungen der Welt, analytisch bearbeitet, nebst einem kritisch-systematischen Verzeichnis aller aussereuropäischen. Arten. Arch. f. Naturgesch. (1917) LXXXIII, Abt. A, heft 1, p. 151.

British Columbia: ♂, Victoria. ♀, Arlin (E. M. Anderson). ♀, Rolla, VII.14.27 (P. N. Vroom), ♀, Nelson, VII.21.27 (A. A. Dennys), ♀, Keremeos, VII.23.23 (C. B. Garrett). [C.N.C.]

California: ♂, Riverside, XI.3.33 (A. J. Basinger).

Colorado: ♀, Lake City, VIII.8–15.36 (C. L. Fluke). ♂, Raymonds, VII.10.37 (R. H. Beamer). [Univ. Kans.]

Idaho: ♀, Moscow Mt., VII.5.12. [U.S.N.M.]

Manitoba: ♀, Hartney, VII.31.37 (H. T. Peters). [Univ. Kans.]

Michigan: ♀, Cheboygan County, VII.3.34 (H. B. Hungerford). ♂, Detroit, V.17.33 (Geo. Steyskal).

Montana: ♂, Bozeman, VII.19.10.

New Mexico: ♀, Red Rion, 9000 ft., VIII.14.40 (F. M. Snyder).

New York: ♂, Ithaca, V.24.22 (L. S. West).

Oregon: ♂, Hood River, VII.17.31 (J. Nottingham). [Univ. Kans.] ♂, Astoria, IV.14.36, ♂, Athena, Wild Horse Mt., V.14.38 (K. Gray & J. Schuh), ♀, Pacific City, Lincoln County, VIII.24.41, ♀, Salem, V.28.40, ♂, ♀, Silverton Hills, Marion County, VI.30.41 (M. & R. E. Rieder). ♂, Corvallis, IV.17.30 (J. Wilcox). ♂, Mary's Peak, VII.12.31, ♂, Independence, VIII.13.34 (N. P. Larson).

Saskatchewan: ♀, Saskatoon, VI.6.23 (N. J. Atkinson).

Washington: ♀, Rochester, VII.22.31 (J. Nottingham). [Univ. Kans.] ♂, Pullman, VII.1.01, ♂, Wawawai, VI.22.12, ♂, Kettle Falls, V.3.12. [U.S.N.M.] 2♀, Rainier National Forest, Sawmill Flat, V.26.35 (J. Wilcox).

Wisconsin: 6 ♂, Dane County, V.21–22.37, 2 ♂, Madison, V.21.35 (F. M. Snyder).

The species *pullula* has been recorded from the ethiopian (Van Emden, 1941) and neotropical (Stein, 1918) regions, as well as being widely distributed throughout those of the palaearctic and nearctic. In North America I find that specimens may or may not possess a bristle at middle of anteroventral surface of mid tibia, the mid and hind femora of occasional female specimens are paler than the fore femur, and in slightly teneral forms the infuscation of *m-cu* crossveins may not be evident. Del Guercio[6] has reported the larvae of the species feeding on *Iris* sp.

Hylemyia (*Craspedochaeta*) *mimetica* (Malloch)

Hylemyia mimetica Malloch, Trans. Amer. Ent. Soc., XLIV: 313 (1918).—Séguy, Gen. Insect., Fasc. 205, p. 103 (1937).

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[6] Guercio, G. del. 1893. La mosca del Giaggiolo, *Hylemyia pullula* Rondani. Bull. Soc. Ent. Ital., XXIV: 321–330.

Hylemyia (*Melinia*) *karli* Ringdahl, Ent. Tidskr., LI: 272 (1929).—Ringdahl, Tromsø Museums Årshefter (1942), LXV: 5 (1943).

Hylemyia karli Séguy, Gen. Insect., Fasc. 205, p. 98 (1937).

Melinia karli Tiensuu, Ann. Ent. Fenn., IV (1): 26 (1938).

Alberta: ♂, Edmonton, IV.30.39, ♀, Wabamun, VI.27.36 (E. H. Strickland). [Univ. Alberta.]

British Columbia: ♂, ♀, Carbonate Columbia River, VII.7–12.08 (J. C. Bradley). ♂, Kaslo, VIII.17.– (A. N. Caudell). [U.S.-N.M.] ♂, Hedley, VII.26.23, ♀, Oliver, VIII.21.23 (C. B. Garrett), ♀, St. Marys, VII.12.26 (A. A. Dennys). [C.N.C.]

Colorado: ♂, Tennessee Pass, VII.25.17 (J. M. Aldrich). [U.S.N.M.]

Idaho: ♂, Craigs Mt., Nez Perce County, VII.23.27. ♂, Waha, V.30.24 (A. L. Melander).

Manitoba: ♂, Aweme, VIII.25.07 (James Fletcher). [C.N.C.]

Massachusetts: ♂, Mt. Holyoke Gap, IX.7.14 (C. H. T. Townsend). [U.S.N.M.]

Montana: ♂, Missoula, VII.6.17 (H. G. Dyar). [U.S.N.M.]

New Hampshire: ♂, Franconia, VIII.2.15 (C.H.T. Townsend), ♀, White Mts. (Morrison).

New Mexico: ♂, Cloudcroft, V.27.02, holotype. [A.N.S.P.]

New York: ♀, McLean Reserve, Bog A, VIII.23.24.

Ontario: ♀, Gold Rock, Rainy River District, VII.25.05 (H. H. Newcomb). ♀, Low Bush, Lake Abitibi, VI.4.25 (N. K. Bigelow). [C.N.C.]

South Dakota: ♂, Spearfish, VII.26.24.

Utah: ♀, Rock Canyon, Provo, June (C. L. Hayward).

The species *mimetica* is darker and more shiny than *pullula,* and has no clouding along *m-cu* crossvein. The copulatory processes in the male differ slightly from the typical form possessed by other species belonging to the group in being more rounded apically. There is little doubt in my mind concerning the validity of the above synonymy.

Hylemyia (*Craspedochaeta*) *facialis* (Malloch)

Hylemyia facialis Malloch, Trans. Amer. Ent. Soc., XLIV: 306 (1918).—Séguy, Gen. Insect., Fasc. 205, p. 91 (1937).

Arizona: ♀, Rillito, Pima County, III.22.34 (A. J. Basinger). 3 ♀, Yarnell Hill, VII.2.29 (R. H. Beamer). [Univ. Kans.]

British Columbia: ♀, Keremeos, VIII.3.23 (C. B. Garrett). [C.N.C.]

California: ♂, Yosemite Valley, V.22.08, holotype. [A.N.S.P.] ♀, San Andreas Canyon, Riverside County, XI.21.33, ♀, Forest Home, 4000 ft., IX.21.35, ♀, Riverside, X.7.34 (A. J. Basinger). ♀, Echo, VIII.10.40 (E. E. Kenaga), ♀, Giant Forest, VII.28.29, ♀, San Jacinto Mts., VII.21.29 (R. H. Beamer). [Univ. Kans.] ♀, Jacumba, VIII.13.17 (Cornell Exped.). [C.U.] ♂, Mt. Home Canyon, San Bernardino Mts., VI.8.24 (J. M. Aldrich). [U.S.–N.M.] ♀, Monrovia Canyon, III.22.32 (C. H. Martin).

Idaho: ♀, Mts., Moscow, VII.25.20 (R. C. Shannon). ♀, Lewiston Hill, V.10.24 (A. L. Melander).

Nevada: 2 ♀, Carson City, VIII.9.29 (R. H. Beamer). [Univ. Kans.]

Oregon: 2 ♂, Siskiyou Pass, Jackson County, 4500 ft., VII.15.30 (H. A. Scullen). [Ore. State Coll.] ♂, ♀, Corvallis, V.20.41 (P. Mowry). ♀, Kiger Island, Benton County, VII.1.41, ♀, Vitta Springs, Benton County, VI.28.42 (R. E. Rieder).

Texas: 2 ♀, Hidalgo County, III.8.34, ♀, Dimmit County, IV.11.33. [Texas A. & M. Coll.]

Utah: ♂, Cedar City, VIII.13.29 (R. H. Beamer), ♀, Cove Fort, VIII.14.29 (P. W. Oman). [Univ. Kans.] ♀, Bountiful, V.29.29 (H. J. Pack).

Wisconsin: ♀, Madison, V.15.36 (F. M. Snyder).

The species *facialis* has both crossveins broadly clouded and the node at base of veins R_{2+3} and R_{4+5} infuscated. In addition the mid and hind femora are typically yellowish in both sexes. The male has the basal sclerite of hypopygium glossy and black, and the female has a reddish patch on interfrontalia at base of antennae. It is to be noted that among the specimens listed above the color of second antennal segment varies from entirely yellow to rufous and fuscous, and that in male specimens from Oregon the mid and hind femora and calyptrae are brownish tinged.

Hylemyia (Craspedochaeta) nigriceps, n. sp.

Male; grayish black, parafrontals and parafacials densely pruinose, face slate gray, interfrontalia whitish gray pruinescent, lower facial mark (between eye margin and vibrissae) lacking; thorax and abdomen grayish, disc of mesonotum slightly fuscous and with trace of three vittae; abdomen with a narrow dorsocentral vitta, basal sclerite of hypopygium glossy. Antennae blackish, second antennal segment subfuscous, palpi black. Fore femora largely infuscated, coxae largely yellowish tinged, tarsi blackish, mid and hind femora and all tibiae yellowish. Wings clear, crossveins largely devoid of infuscation, calyptrae clear, halteres slightly reddish tinged. Eyes separated by a distance about equal to that between posterior ocelli exclusive, parafrontals contiguous, parafacials and cheeks not wider than breadth of third antennal segment, arista short pubescent. Thorax with one strong pair of presutural acrostical bristles, prealar bristle short, disc of scutellum devoid of setulae. Abdomen moderately slender, depressed, processes as in *pullula.* Fore tibia with 2 posteroventral bristles, mid femur with 5 or 6 stout posteroventral bristles, anteroventral surface bristleless, mid tibia with no anterodorsal, 2 posterodorsal, 3 posterior bristles, hind femur with a complete series of anteroventral bristles, those on proximal half shorter and finer, with several short bristles on distal half of posteroventral surface, hind tibia with 1 anteroventral, 7 to 9 anterodorsal, 3 posterodorsal bristles, and 3 or 4 setulae on medial half of posteroventral surface. Costal thorns small, *m-cu* crossvein sinuate and oblique. Length 6 mm.

Female with frontal vitta entirely blackish, prealar bristle as long as posterior notopleural bristle, lower bristle of posterior pair of sternopleurals nearly as strong as upper anterior bristle. Fore tibia with one medial anterodorsal and one posteroventral bristle, mid femur with a bristle at base of anteroventral surface and with 3 or 4 bristles on proximal half of posteroventral surface, mid tibia with 1 anterodorsal, 2 posterodorsal and 1 posterior bristle, hind femur with 4 or 5 anteroventral bristles, posteroventral surface bristleless, hind tibia with 1 anteroventral, 4 or 5 anterodorsal, 3 posterodorsal bristles. Costal thorn short. Otherwise conforming to the male.

Holotype: ♂, Monrovia Canyon, California, VII.6.30 (C. H. and D. Martin).

Allotype: ♀, Mt. Wilson, California, VIII.30.– (C. H. Martin). [U.S.N.M.]

Paratypes: ♀, Lompoc, California, VIII.6.38 (L. W. Hepner), ♀, Santa Cruz Mts., California, VIII.13.38 (R. H. Beamer). [Univ. Kans.]

The species *nigriceps* is most closely related to *facialis,* from which it may be separated by the absence of broad clouding along crossveins, and by the more linear dimensions of abdominal vitta. In both sexes the anteroventral bristles of hind femur are not as stout as in *facialis,* and in the female of *nigriceps* the frontal vitta is entirely blackish.

Acrostilpna Ringdahl

Acrostilpna Ringdahl, Ent. Tidskr., LI: 269 (1929).

Genotype: *Anthomyza latipennis* Zetterstedt (by original designation).

The subgenus *Acrostilpna* was proposed by Ringdahl (1929) for the inclusion of four Swedish species, of which *Anthomyza latipennis* Zetterstedt was selected as the type. These four species, namely, *latipennis* (Zett.), *atricauda* (Zett.), *collini* Ringd. and *luteisquama* Ringd. occur also in North America in addition to the two native forms *sedula* (Huck.) and *latipennis* (Stein not Zett.).

> The group may be described as composed of robust forms, pale grayish in general aspect, with dense pruinescence, female with prominent thoracic stripes along planes of dorsocentral bristles; setulae of postocular series in male mostly short and stiffish, antennae longish, oral margin flexed abruptly forward, parafacials and cheeks restricted to narrow proportions for the greater part, proboscis in male slender, upper occipital region immediately below postocular series with several setulae, mesopleura with a bristlelike seta on upper margin adjacent anterior notopleural bristle, stigmatal bristles below mesopleural spiracle devoid of accessory setulae at base, sternopleural bristles arranged 2:2; basal sclerite of hypopygium in male polished and black, copulatory processes typical of *latipennis* (fig. 3), sublamellate and truncated at apex, with few bristles on outer surface, fringed with fine setulae along inner margin, ventral border in profile convex; fifth segment of fore tarsus in female enlarged, oblong, except in *latipennis* (Zett.) and *sedula;* costa with setulae on lower surface between humeral crossvein and costal thorn.

Key to Species.

(Males.)

1. Hind femur with bristles on proximal half of antero- and posteroventral surfaces, fore tibia with apical posteroventral bristle not fine and setulose 2

Hind femur with no bristles on proximal region of antero- and posteroventral surfaces exclusive of basal bristle, fore tibia with apical posteroventral bristle fine and setulose 4

2. Calyptrae densely yellowish, hind tibia with 8 or more anteroventral bristles, the series duplicated basad, and with apical posteroventral bristle usually not longer than basal spine on hind metatarsus, processes fringed on inner margin from base to apex with a conspicuous series of longish setulae . . . . *replicata* (Huck.)

Calyptrae not densely yellowish, hind tibia with not more than 6 anteroventral bristles, the series not duplicated basad, and with apical posteroventral bristle robust, longer than basal spine on hind metatarsus, processes with a few sparsely arranged setulae on inner margin 3

3. Lateral declivities of mesonotum infuscated, vittae along planes of dorsocentral bristles not strongly marked, parafacials at narrowest less than half length of third antennal segment, cheeks at narrowest less than one quarter height of eye. *latipennis* (Zett.)

Lateral declivities of mesonotum pale gray, vittae along planes of dorsocentral bristles well marked, parafacials at narrowest equal to half length of third antennal segment, cheeks at narrowest equal to one quarter height of eye. *sedula* (Huck.)

4. Hind tibia with apical posteroventral bristle setulose, mid tibia with two longer apical bristles on ventral aspect, the apical posteroventral bristle being weakly developed 5

Hind tibia with apical posteroventral bristle robust, mid tibia with three longer bristles on ventral aspect, the apical posteroventral bristle being strongly developed. *collini* Ringd.

5. Hind tibia with one or two anteroventral bristles, apical posterodorsal bristle usually robust, calyptrae whitish. **restorata** n. n.

Hind tibia with 6 or 8 anteroventral bristles, apical posterodorsal bristle usually setulose or weak, calyptrae yellowish. *atricauda* (Zett.)

(Females.)

1. Hind femur with one or more bristles on proximal half of antero- and posteroventral surfaces 2

Hind femur with bristles on antero- and posteroventral surfaces not extending to proximal third, or if present weak and setulose, exclusive of basal bristle 4

2. Fifth segment of fore tarsus about twice as large as that of mid tarsus, disc of scutellum with several setulae. *replicata* (Huck.)

Fifth segment of fore tarsus about equal to that of mid tarsus, discal region of scutellum devoid of setulae 3

3. Tergum 5 largely suffused with fuscous reflections, parafacials at narrowest usually less than width of third antennal segment .... *latipennis* (Zett.)

Tergum 5 usually largely grayish, parafacials at narrowest usually as wide as breadth of third antennal segment. *sedula* (Huck.)

4. Mid tibia with a medial anteroventral bristle, apical posterodorsal bristle on hind tibia usually strong 5

Mid tibia with no medial anteroventral bristle, apical posterodorsal bristle on hind tibia usually weak .. *atricauda* (Zett.)

5. Hind tibia with apical posteroventral bristle robust, longer than basal spine on hind metatarsus, upper calyptra yellowish. *collini* Ringd.

Hind tibia with apical posteroventral bristle setulose, seldom as long as basal spine on hind metatarsus, calyptrae whitish. **restorata** n. n.

Hylemyia (*Acrostilpna*) *replicata* (Huckett)

Hylemyia replicata Huckett p. p., Can. Ent., LXI, June, p. 136 (1929).

Hylemyia (*Acrostilpna*) *luteisquama* Ringdahl, Ent. Tidskr., LI, Dec., p. 271 (1929).—Ringdahl, Tromsø Museums Årshefter (1942), LXV (2): 4 (1943).

Hylemyia luteisquama Ringdahl, Ark. Zool., XXI A (20): 5 (1930).—Séguy, Gen. Insect., Fasc. 205, p. 102 (1937).

Alberta: ♂, Drayton, VI.29.38, ♂, Wabamun, VII.1.35, ♀, Jasper, VII.23.38, ♂, Edmonton, V.24.36 (E. H. Strickland). [Univ. Alberta.] 2 ♂, Banff, VIII.30.17. [Mus. Nat. d'Hist. Natur.]

Michigan: ♀, Isle Royal, VIII.3–7.36 (R. R. Dreisbach). [F. M. Snyder.]

New Hampshire: ♂, Kinsman Notch, VII.7.31, ♂, Noxon Camp, 2000 ft., VII.7.31 (J. M. Aldrich). [U.S.N.M.]

North-West Territories: ♀, Fort Wrigley, Mackenzie River, VII.17.22 (C. H. Crickmay).

The male of *replicata* is notable on account of the stouter truncate form of the abdomen. In both sexes there are several accessory setulae on discal surface of scutellum. In my description of *replicata* I have mistakenly included as the allotype a female belonging to the species *latipennis* (Zett.). This error was largely due to the confusion then prevalent in collections concerning the identity of Zetterstedt's species, evidently as a result of Stein's (1898) misnaming of North American material sent to him for determination.

Hylemyia (*Acrostilpna*) *latipennis* (Zetterstedt)

Anthomyza latipennis Zetterstedt, Ins. Lapp., p. 676 (1838).

Aricia latipennis Zetterstedt, Dipt. Scand., IV: 1508 (1845).

Chortophila latipennis Pandellé, Rev. ent. France, XIX: 259 (1900).—Collin, Ent. Month. Mag., LXIII: 131 (1927).

Pegomyia (*Pegomyia*) *latipennis* Schnabl and Dziedzicki, Abh. K. Leop.-Carol. Deutsch. Akad. Naturforsch., XCV (2): 112 (1911).

Hylemyia latipennis Stein, Arch. f. Naturgesch. (1915), LXXXI, Abt. A, heft 10, p. 151 (1916).—Séguy, Gen. Insect., Fasc. 205, p. 99 (1937).

Chortophila (*Egeria*) *latipennis* Karl, Tierwelt Deutschlands, XIII, Pt. 3, p. 156 (1928).

Hylemyia consobrina Huckett, Can. Ent., LXI: 187 (1929).

Hylemyia (*Acrostilpna*) *latipennis* Ringdahl, Ent. Tidskr., LI: 270 (1929).—Ringdahl, Opus. entom., IV (3–4): 142 (1939).—Ringdahl, Tromsø Museums Årshefter (1942), LXV (2): 4 (1943).

Acrostilpna latipennis Collin, Jour. Soc. Brit. Ent., I, Pt. 1, p. 22 (1934).

Alaska: ♀, Katmai, June, 1917 (J. S. Hine).

Alberta: ♀, Edmonton, VI.25.45, ♂, Wabamun, VI.18.37 (E. H. Strickland). [Univ. Alberta.]

British Columbia: ♀, Keremeos, VI.26.23 (C. B. Garrett), ♀, Malakwa, VIII.8.23 (E. R. Buckell). [C.N.C.]

Massachusetts: ♀, Mt. Greylock, VI.15.06.

Michigan: ♀, Douglas Lake, VIII.14.25 (H. B. Hungerford). [Univ. Kans.]

New Hampshire: 3 ♂, ♀, Mt. Washington (Mrs. A. T. Slosson). ♂, Mt. Washington, Alpine Garden, VII.11.31 (A. L. Melander), ♂, Halfway House, Mt. Washington, VII.4.14, ♀, Bretton Woods, VI.26.13.

New York: ♂, Top Mt. MacIntyre, VIII.2.40 (H. Dietrich), ♂, Adirondack Lodge, VI.28.23 (M. D. Leonard).

Ontario: ♂, Waubamic, Parry Sound, VI.4.15. ♀, Chalk River, VIII.25.19 (R. N. Chrystal).

Quebec: ♂, Harrington Harbor, VII.2.29 (W. J. Brown). [C.N.C.]

Vermont: ♀, Mt. Equinox, 3000 ft., VIII.29–30.08.

Washington: ♀, Mt. Baker, Nooksack River, VIII.11.25 (A. L. Melander).

Wyoming: ♀, Yellowstone Park, Madison Junction, VII.27.23 (A. L. Melander).

The male of *latipennis* (Zett.) possesses many of the characters common to *replicata* as mentioned in the key. It differs notably from the latter species in the slender form of the abdomen and in the lack of setulae on discal surface of scutellum. The female of *latipennis* has the fifth fore tarsal segment unenlarged. The larvae of the species have been recorded by de Meijere[7] as mining in the leaf-stalk of the fern *Athyrium filix femina.*

Hylemyia (*Acrostilpna*) *sedula* (Huckett)

Hylemyia sedula Huckett, Can. Ent., LXI: 183 (1929).—Séguy, Gen. Insect., Fasc. 205, p. 112 (1937).

Manitoba: ♀, Aweme, VI.23.27 (N. Criddle), ♀, same locality, VII.28.20 (H. A. Robertson).

Michigan: ♂, ♀, Douglas Lake, VII.15–20.26 (C. Martin), ♀, Cheboygan County, VII.6.33, ♂, Lake County, VI.8.40 (R. R. Dreisbach).

New Jersey: ♀, Brown's Mill Jnct., V.21.05.

The species *sedula,* closely resembling *latipennis* (Zett.), is smaller and has the cheeks higher below the eye and parafacials broader ventrad of base of third antennal segment. The fifth abdominal tergum and lateral regions of mesonotum are largely pale gray, whereas in *latipennis* these areas are usually suffused with infuscation. In nearly all specimens of *sedula* that I have seen there are evidences of one or more minute setulae on distal third of vein R_1 on upper surface of wing.

Hylemyia (*Acrostilpna*) *collini* Ringdahl

Hylemyia (*Acrostilpna*) *collini* Ringdahl, Ent. Tidskr., LI: 271 (1929).—Ringdahl, Tromsø Museums Årshefter (1942), LXV (2): 4 (1943).

Hylemyia collini Séguy, Gen. Insect., Fasc. 205, p. 87 (1937).

Alberta: 3 ♂, Wabamun, V.27.36, same locality, 2 ♂, VI.27.36, ♂, VII.1.35, ♀, VII.1.39 (E. H. Strickland). [Univ. Alberta.]

Labrador: ♂, Nain, late June, 1922 (Waugh).

The species *collini* possesses a more extensive series of anteroventral bristles on hind femur than in *atricauda* or *restorata,* but in no case does the series extend to proximal region as in *latipennis* and *replicata.* It differs notably from the former two species in having a robust apical posteroventral bristle on hind tibia.

Hylemyia (*Acrostilpna*) *atricauda* (Zetterstedt)

Aricia atricauda Zetterstedt, Dipt. Scand., IV: 1529 (1845).

Hylemyia (*Acrostilpna*) *atricauda* Ringdahl, Ent. Tidskr., LI:

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[7] Meijere, J. C. H. de. 1911. Über in Farnen Parasitierende Hymenopteren- und Dipteren- Larven. Tijdschrift voor Entomologie, LIV: 106–111.

269–70 (1929).—Ringdahl, Tromsø Museums Årshefter (1942), LXV (2): 12 (1943).

Alaska: ♂, 3 ♀, Virginia Bay, VI.26.99 (T. Kincaid, Harriman Exped.). [U.S.N.M.]

Colorado: ♂, Pingree Park, VII.10.38 (M. T. James). [Colo. State Coll.]

Maine: ♂, Orono, VI.5.13 (H. M. Parshley).

Michigan: ♀, Schoolcraft County, Floodwood, VII.21.15 (J. S. Rogers).

New Brunswick: ♂, Fredericton, VI.25.15 (A. B. Baird).

New Hampshire: ♂, Jaffrey, VI.4.20. ♀, Mt. Monadnock, VII.26.26 (A. L. Melander).

New York: ♂, Whiteface Mt., Adirondacks, VII.4.21, 3000 ft. (J. M. Aldrich). [U.S.N.M.] ♂, ♀, Lake Tear, Essex County, 4300–4600 ft., VII.20–21.20.

Ontario: 2 ♂, ♀, Low Bush, Lake Abitibi, VI.18–30.25 (N. K. Bigelow).

Quebec: ♀, Harrington Harbor, VII.4.29 (W. J. Brown). [C.N.C.]

Vermont: ♀, Peak of Mt. Mansfield, VIII.17.35 (Blanton & Borders).

The species *atricauda* and *restorata* lack the robust bristle at apex of posteroventral surface of hind tibia, thereby differing from the remaining species in the group. In *atricauda* the hind tibia has usually a weak apical posterodorsal bristle and six to eight anteroventral bristles, whereas in *restorata* the apical posterodorsal bristle is usually strong and there are two or three anteroventral bristles. In the female of *atricauda* there is no anteroventral bristle on mid tibia, and the enlargement of fifth fore tarsal segment is not so marked as in other species.

Hylemyia (Acrostilpna) restorata nom. nov.

Chortophila latipennis Stein not Zetterstedt, Berl. Ent. Zeitschr. (1897), XLII (3–4): 235 (1898).

Phorbia latipennis Aldrich, Misc. Coll. Smithsn. Inst., LXVI: 557 (1905).

Hylemyia latipennis Huckett, Mem. 77, N. Y. (Cornell) Agr. Exp. Sta. (1923), p. 30 (1924).

Connecticut: ♀, Stamford, V.22.31 (Bartlett Tree Research Labr.).

Georgia: ♂, 11 ♀, Indian Springs, IV.8–13.40 (H. C. Huckett).

Massachusetts: ♂, Wellesley, V.20.09 (J. D. Tothill), ♂, Reading, V.15.15 (C. W. Collins), ♀, near Salem, VI.9.18. [U.S.N.M.]

New Jersey: ♀, Laraway, Ocean County, V.28.16. [U.S.N.M.]

New York: Long Island; ♂, ♀, Babylon, VI.1–8.35, holotype and allotype. [U.S.N.M.], 5 ♂, 3 ♀, same locality, VI.3–26.35, ♀, Dix Hills, V.19.35, 3 ♀, West Hills, VI.1.35 (all Blanton & Borders), ♀, Hicksville, VI.3.44, ♂, Selden, V.12.24, ♀, Riverhead, V.20.23 (H. C. Huckett). ♀, Ringwood near Ithaca, VI.13.22, ♀, McLean Bogs, Tompkins County, V.30.21 (M. D. Leonard), ♂, Mt. MacIntyre, summit, VIII.29.22 (Shannon & Sibley), ♂, ♀, Top Mt. Whitface, VI.21.36 (H. Dietrich).

North Carolina: ♀, Raleigh, IV.11.33 (C. S. Brimley). [F. M. Snyder.]

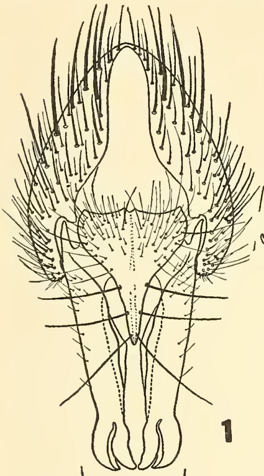
Ohio: ♀, Vinton, VI.5–12.00 (J. S. Hine).

The species *restorata* differs notably from *latipennis* (Zett.), under which name it has recently appeared in North American literature, in the bristling of the hind femur as stated in keys. The male of *restorata* may further be distinguished from that of *latipennis* by the weaker or finer development of apical bristle on posteroventral surface of fore and hind tibiae, and in the female by the enlarged flat appearance of fifth fore tarsal segment.

Explanation of Plate III.

Male copulatory appendages, showing caudal or dorsal and lateral aspects of tergum 9, ventral aspect of sternum 5, and lateral aspect of processes of sternum 5.

Figures 1, 2, 3, 3a. *Acrostilpna latipennis* (Zetterstedt).
Figures 4, 5, 6, 6a. *Craspedochaeta pullula* (Zetterstedt).
Figures 7, 8, 9, 9a. *Craspedochaeta punctipennis* (Wiedemann).



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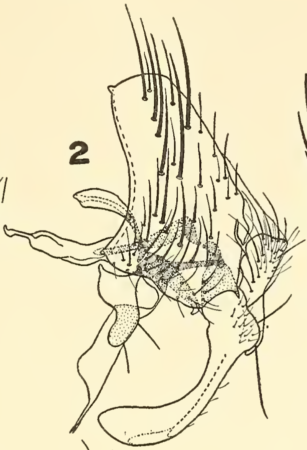

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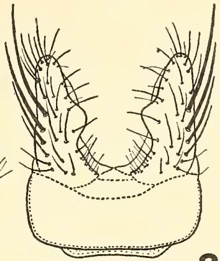

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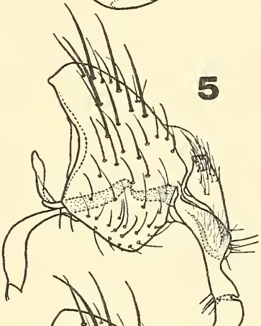

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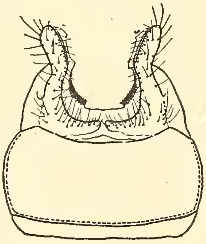

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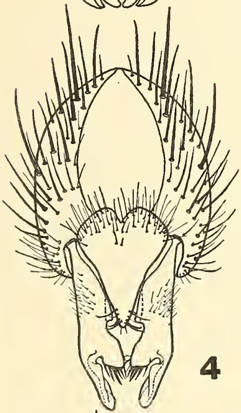

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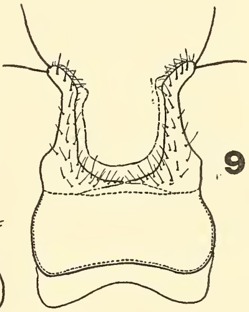

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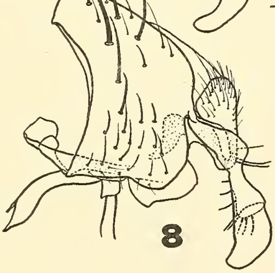

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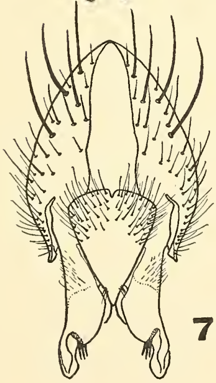

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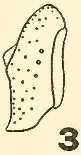

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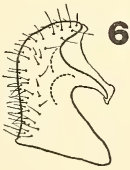

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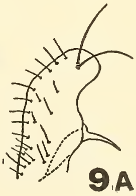


9A

A NORTH AMERICAN DIEUCHES (HETEROPTERA, LYGAEIDAE, BEOSINI).

By J. R. de la Torre-Bueno, Tucson, Arizona.

In the Arizona material I have received in the 11 years I have been in the State, a number of specimens of a lygaeid have come to me, which runs to *Dieuches* in Stål's Keys, which seems as yet undescribed, or perhaps unrecognized.

One species of *Dieuches* has been recorded from America, namely, *Lygaeus armipes* Fabricius 1794, stated by this author to be from "Ins. Am." (Ent. Syst. IV: 164; Syst. Rhyng., 1803, p. 231). Now, in Hemiptera Fabriciana I: 79, under *Beosus armipes* (no. 3), Stål says categorically: "Exemplum typicum *Lygaei armipedis,* cujus patriam incorrecte indicavit Fabricius, masculum est." This, in English, is: "The typical example of Lygaeus armipes, the locality of which (patria) Fabricius indicated *incorrectly* (Italics mine), is a male." [The rest refers to the distinctive characters of the species (see following).] In addition, Stål synonymizes the species to *Lygaeus albostriatus* Fabricius (Syst. Rhyng., p. 229); and to his own citation of *Beosus albo-striatus* (Hem. Afr. II: 168), from Guinea, in Africa. In the face of this, and of the fact that it seems never again to have been recorded from anywhere in the Americas, how it should still be deemed to be possibly American, becomes difficult to understand; this even though *Rhyparachromus armatipes* Walker 1872 should be synonymized with it, as was done by Distant. The latter author's conception of species and of indentities has moments of vagueness; and at times his findings are not wholly reliable.

Lethierry & Sévérin, in their Catalogue, carry *Rhyparochromus armatipes* Walker under the head "Aphanidarum subfam. species incerti generis," merely repeating the distribution as in the original description.

In any case, the unicolorous species here described cannot be *L. armipes* Fabricius, which Stål (Hem. Fabr., p. 79, note), states to have "membrana macula apicali grisea notata"; if *R. armatipes* Walker is identical with *armipes* Fabricius, it must likewise have this characteristic, which rules out the latter also.

As said, the present species runs to *Beosus* (= *Dieuches*) in both the Stål keys referred to.

Dieuches occidentalis, n. sp.

Head, length 18, width 24, including eyes, upper surface finely shagreened, no fine longitudinal median line, apparently smooth below; tylus blunt, very slightly projecting beyond juga; ocelli small, clear, slightly more than their own diameter distant from the eyes, set just below an imaginary line from eye to eye at their closest distance. Antennae—Length, 6.25 mm., segments 21:41:30:33; segment I slightly thickened apically, extending beyond tylus by its own length, II slightly curved, of equal diameter throughout, IV slightly curved, of equal diameter throughout, conically pointed at apex; antennal tubercles not prominent, rounded. Rostrum extending to or beyond posterior coxae, length, 3 mm. plus; segments 20:18:15:10. Pronotum, length, 24, width, 44 (at humeri); transverse groove about midway, crossed at middle by a short blunt carina; sides narrowly laminate, evanescent and curved anteriorly and posteriorly; collar narrow; posterior lobe finely punctured, punctures sparser toward base, anterior lobe impunctate; lateral margins sinuate, posterior margin faintly concave. Scutellum, length 23, width, 25, acute, disc somewhat elevated, punctured, more sparsely so toward margins. Hemelytra—clavus punctured confusedly, not in rows; longitudinal veins of corium each with a single row of punctures, impunctate between the veins; veins of membrane simple, more or less curved, concolorous. Legs—anterior femora moderately incrassate, with four conical spines running from middle to apex, and behind middle, one very small spine; anterior tibiae enlarged at apex; all femora stouter than their respective tibiae; all tibiae with two longitudinal rows of bristles; posterior tarsal segment I twice II and III taken together (I, 20, II plus III, 10). Venter smooth, with long sparse setae; male genital plate simple; dorsal length from apex of scutellum, 75, width at widest part of abdomen, 30. Length of type, 7 mm.

Concolorous brownish, except the stramineous semitransparent expanded thin margins of the pronotum and hemelytra; legs and antennae yellowish.

Type: male, Madera (White House) Canyon, Santa Rita Mountains, Arizona, altitude, about 5000 feet, Owen Bryant collector; in author's collection.

Paratypes: males, Chiricahua Mountains, Arizona, June 23, 1933, Owen Bryant collector (Lot #228); Globe, Arizona, September 1933, Frank H. Parker collector (Lot #97), (head and thorax missing); females, Santa Catalina Mountains, July 1933, Bryant; White Mountains, July 13, 1933, Parker (Lot #112); Santa Rita Mountains, June 8–12, 1935, Parker; Santa Catalina Mountains, July 15, 1938, Bryant (Lot #21); Graham Mountain, July 24, 1933, Parker (Lot #6).

These localities are all between 3000 and 5000 feet elevation, or perhaps more. Apparently, this is a mountain species.

NOTE—Proportional units = 1/20 millimeter, exactly. Description drawn up at magnification 20.

P.S.—The correct place of publication and date of appearance are: Ent. Am. XXVI (n.s.), No. 3, p. 119, in "A Synopsis of the Hemiptera-Heteroptera of America North of Mexico. Part III. Family Lygaeidae." The Date of Issue of this part is October 1, 1946.—J. R. T.-B.

MEMBERS CORNER.

The Newark Entomological Society, meeting on February 10 at the Newark Museum, honored the memory of Charles Rummel, who died on January 1, 1946, in his 79th year. Mr. Rummel was one of the Society's most active members. He was an outstanding amateur entomologist and field naturalist. Though he lacked formal scientific training, he knew and understood the meaning of scientific method, and brought it to bear on the shrewd observations which he made of the activities of insects. A living insect was of more interest to him than a rare specimen, but at the same time he was a skilled collector. He specialized in collecting the insects of New Jersey and much of his collection is now in the possession of the Newark Museum. He prepared numerous exhibits for the Newark Museum and for schools in Newark and vicinity. But his greatest happiness, and perhaps his greatest achievement, lay in the introduction of young people to the joys and mysteries to be found in the study of insects.

OTTO BUCHHOLZ.

NOTES ON AMERICAN RHYNCOLUS, WITH DESCRIPTION OF A NEW SPECIES (COLEOPTERA, CURCULIONIDAE).

By L. L. Buchanan, Washington, D. C.

In the North American fauna, *Rhyncolus* is divisible into two main groups, the first comprising usually larger and more elongate species, similar to the European *ater* (L.), and having, in the male, a densely pubescent patch on the middle part of abdominal sternite 1; in the second group the species are, on the whole, smaller and stouter, and their males lack a pubescent patch on abdominal sternite 1. This paper briefly treats the six American species of group 1.

I am indebted to Guy A. K. Marshall for information on certain Wollaston types in the British Museum; to E. T. Cresson, Jr., for notes on Horn types in the Philadelphia Academy; to J. J. Davis for the opportunity of studying type material of *Rhyncolus carinatus* Blatchley in the Purdue University Collection; and to coworkers for the loan of specimens. Figures 1, 2, and 3 were drawn by Arthur Cushman, staff artist; the dots on the elytra in figure 1 show the location of the striae and do not represent punctures.

Rhyncolus, as interpreted here, dates from 1817, when Germar (Mag. Ent., II, p. 340) listed the name, without description, but in association with one described species, as follows: "*Rhyncolus* Creutz." [Ms. name of Creutzer] "Hylesinus cloropus Fab." The combination *Hylesinus chloropus* was used by Fabricius in 1801 (Syst. Eleuth., II, p. 393), where *chloropus* was described, but not as a new species, for Fabricius cites literature references by which the specific name traces back to *Curculio cloropus* L. 1761 (Fauna Suecica), and this, by identity of description, to *Curculio cloropus* L. 1758 (Syst. Nat., Ed. 10, p. 385, No. 69). It appears, accordingly, that the "*chloropus* Fab." (a synonym of *ater*) of the Gemminger and Harold catalogue (*Rhyncolus*), and of the Winkler and Schenkling catalogues (*Eremotes*), should read *chloropus* L., or *cloropus* L. On nomenclatorial grounds, at least, *Curculio chloropus* L. 1758 is thus the genotype of *Rhyncolus* Germar 1817, provided (as is done in the present paper) that Germar's citation, previously quoted, is taken as an "indication," in the meaning of article 25a and opinion 1 of the International Rules of Zoological Nomenclature, sufficiently definite to validate the generic name. In 1937 (Roy. Ent. Soc. London, Proc., VI, 3, p. 54) Marshall proposed another interpretation of *Rhyncolus* based on Germar's later paper (Ins. Spec. Nov., 1824, p. 308).

Rhyncolus macrops, n. sp. (Figs. 1, 2, and 4)

♂, ♀. Length 3–4 mm.; width 1–1.2 mm. Elongate, parallel, red-brown to blackish, the legs, antennae, and usually the vertex of head, and the rostrum in part, paler, prothorax often a little darker than elytra, upper surface shiny, the rostrum and pronotum usually minutely alutaceous. Habitus of *brunneus* Mann., but eyes larger, upper profile of rostrum broadly concave (figs. 2 and 3), and general color darker.

Rostrum a little shorter and thicker than in *brunneus,* subparallel-sided or slightly narrowed from eyes to middle, where it is slightly but abruptly dilated, the apical section of scrobe partially visible from above; epistoma usually emarginate at middle, the left lobe thus formed usually wider and more advanced than the right, the right lobe usually more elevated; center of dorsum of rostrum usually with a shallow impression, which is occasionally small, rounded, and isolated, but oftener broad and vague and forming the apical part of a broad shallow median sulcus, which in a few specimens extends to a point opposite posterior edge of eye, the posterior half of the sulcus, when present, narrower and sometimes reduced to a short, feeble, isolated interocular groove; punctures on rostrum and head small, only moderately dense, those on rostrum sometimes here and there subconfluent longitudinally, those on vertex of head much finer; antenna stouter in male than in female, joint 2 distinct in both sexes; eyes convex. Prothorax a little longer than wide (about 11 to 10), widest behind middle, apical constriction usually traceable across dorsum; dorsal surface with small, not dense punctures, which in different specimens vary in size and spacing so that they are separated by distances from less than, to twice as great as, the diameter of a puncture; an impunctate median line of variable length (but not reaching either base or apex) sometimes present. Elytra a little wider than, and about twice as long as, prothorax, twice as long as wide; striae with regular rows of close-set punctures; intervals moderately convex, each with a row of minute punctures, the striae often deeper and the intervals more strongly convex on declivity than on dorsum. Underside with small, not very dense punctures. Male with a broad median area on sternite 1 and, continuous with it, a narrower median area on base of sternite 2 flattened or broadly, feebly impressed, the punctures in this common area smaller and denser than laterally, and bearing long, fine, slanting, pale-yellowish hairs which, in oblique side light, form a conspicuous golden patch; sternite

> 5 densely punctate, more densely so in apical half, and with rather long pale-yellowish hairs, the vestiture sometimes more or less completely wanting (apparently through abrasion). Female with base of abdomen slightly convex, the first two sternites subevenly punctate from side to side; apical half of sternite 5 more densely punctate than base, and with hairs much as in male.

Type.—Male, United States National Museum Cat. No. 57915.

Type locality.—Mount Lyall, Quebec, 1,500 feet, July 6, 1933, W. J. Brown.

Distribution (paratype).—(CN = Canadian National Collection, H = Ralph Hopping Collection, F = collection of C. A. Frost, MCZ = Museum of Comparative Zoology, S = collection of G. Stace Smith, USNM = United States National Museum, Ut = Utah State College Collection.) CANADA: Quebec (Mount Lyall, W. J. Brown, CN); (Gaspé, E. B. Watson, dry balsam, CN and USNM); (Laniel, M. B. Dunn, CN); (Duparquet, G. Stace Smith, *Pinus* and on lake driftwood, S. and USNM); Ontario (Michipicoten Island, Lake Superior, Hubbard and Schwarz Collection, USNM); Nova Scotia (Round Hill, CN); British Columbia (Terrace, Mrs. M. E. Clark, F. and USNM); (Stanley, K. Graham, *Abies lasiocarpa,* H. and USNM); (Lorna, H. Richmond, *Abies lasiocarpa,* H); (Midday Valley, Merritt, K. F. Auden, H); (Trinity Valley, U. R. Howell, *Pseudotsuga taxifolia,* H); (Steelhead, H. B. Leech, *Abies amabilis,* H).

UNITED STATES: Maine (Waldoboro, in rotten fir stump, USNM); New Hampshire (N. H., MCZ); (White Mts., Woods, MCZ); (Mt. Wash[ington], Blan[chard], MCZ); New York (Cranberry Lake, *Abies balsamea,* USNM); Michigan (Marquette, Hubbard and Schwarz Collection, USNM); (Grand Ledge, Hubbard and Schwarz Collection, USNM); Colorado (Jones Ranch, Durango, *Pinus ponderosa,* H); (Boulder, Casey Collection, USNM); (Longmont, 10,500 feet, dead fir, USNM); Utah (Logan Canon, Wm. P. Nye, *Abies lasiocarpa,* USNM and Ut); New Mexico (Casey Collection, USNM); Wyoming (Saratoga, *Pinus flexilis,* USNM); Washington (Satsop, Burke, *Abies grandis,* USNM); (Metaline *Falls, Pinus,* USNM); (Longmire, R. L. Furniss, in base of dead *Abies grandis,* one specimen among a large series of *Rhyncolus brunneus,* USNM); Oregon (Siskiyou, F. P. Keen, *Pinus monticola*).

Nearest to *brunneus* Mann. with which it has sometimes been confused. The two differ as shown in the key. Specimens of *macrops* have been returned to several museums and correspondents under the manuscript name *simulus.*

KEY TO SPECIES OF RHYNCOLUS OF GROUP 1.

(The antennal difference mentioned in couplet 3, though an important taxonomic character, fails in occasional specimens.)

Male with dense patch of pubescence on middle of abdominal sternite 1 1

Male without such a pubescent patch; western U. S. (smaller species not treated here)

1. Red brown to piceous black, elytral intervals evenly convex, not carinate on dorsum, and each with a submedian row of fine punctures; intervals 3 and 9 coalescent near apex of elytron, the apex of 7 either separated from 9 or joined thereto, but in any case 7 and 9 do not coalesce into the base of a short, broad, apical costa; joint 2 of funicle distinct, not so deeply embedded in 1 (figs. 4 and 5); epistoma usually emarginate near middle, the left lobe thus formed usually wider and more advanced than the right lobe 2

   Piceous black to black, usually more coarsely punctured species; elytral intervals usually not evenly convex, at least 4, 5, and 6 on dorsum sometimes carinate along their inner margins; intervals 7 and 9 coalescent some distance from apex of elytron and there merging into a broad, often irregular costa which extends parallel to side margin and cuts across apex of 3 to join apex of 2 or 1; joint 2 of funicle very short, deeply embedded in 1 (fig. 7) (except in *cylindricollis* in which the elytral carinae are well developed); epistoma not or feebly emarginate, if emarginate the right lobe usually more advanced than the left 3

2. Rostrum slightly longer, profile of its dorsum straight or feebly convex (fig. 3); eyes smaller; punctures on prothorax above larger and denser; elytral intervals a little narrower, strial punctures, in side light, appearing larger, and more quadrate in outline; male with the pubescent patch at base of abdomen confined to sternite 1. Length 2.8–4.6 mm. *brunneus* Mann.

   Rostrum shorter, profile of its dorsum broadly concave (fig. 2); eyes larger; punctures on prothorax above smaller and sparser; elytral intervals slightly wider, the strial punctures appearing smaller and more definitely rounded; male with the pubescent patch at base of abdomen present on both sternites 1 and 2. Length 3–4 mm. . . . . . . *macrops* Buch.

3. Joint 2 of funicle, 2 or 2.5 times as wide as long, less deeply embedded in 1 (fig. 6) ; some of dorsal intervals of elytra, especially 4, 5, and 6, with their inner margins elevated and appearing finely but distinctly carinate, the surface of these intervals, beginning at the carinae, sloping transversely downward to the next succeeding stria in a straight or nearly straight line; sides of prothorax nearly always broadly rounded; rostrum a little longer and, both in dorsal and lateral views, more distinctly tapering from base to apex; punctures on elytral intervals only slightly larger than in *brunneus;* apical costa of elytra not very prominent. Pacific Coast. Length 3.3–4.2 mm. . . *cylindricollis* Woll.

Antennae stouter, joint 2 deeply embedded in 1 (more deeply so in male) and with its visible portion 3 or 4 times as wide as long (fig. 7) ; dorsal intervals not or more feebly carinate, the general surface of intervals 4, 5, and 6 rather more convex; sides of prothorax straight or nearly so, or emarginate, slightly converging from near base to about apical fourth; rostrum shorter, scarcely thinner toward apex than at base, sides in dorsal view subparallel or at least not usually so plainly converging towards apex. Dorsal punctation coarser 4

4. Length 3–3.6 mm.; elytra in dorsal view with some fine but usually distinct murications on the lateral outline behind the middle (the murications are on interval 7) ; hairs on elytral declivity longer; eastern half of the United States. *discors* Csy.

Average size larger; elytra without or with bare traces of lateral murications; hairs on elytral declivity shorter; western half of the United States 5

5. Length 3.3–4.4 mm.; punctures on elytral intervals coarser, especially towards apex; apical costa of elytra less prominent, not extending basad, on interval 7, past the junction of intervals 7 and 9 (though at this point merging with a lower and narrower costa on interval 7) ; on the elytral declivity, intervals 2, 3, and 4 are narrower, more strongly convex, and more roughly sculptured, and the striae deeper and wider, than on dorsum; prothorax above with the lateral punctures denser than in *nimius* and sometimes irregularly confluent; chiefly along Pacific Coast. *oregonensis* Horn

Length 3.8–5 mm.; punctures on intervals a little smaller; apical costa more prominent and extending basad, on interval 7, a short distance past the junction of intervals 7 and 9; intervals and striae on elytral declivity about as they are on dorsum; prothorax above with lateral punctures less dense; Arizona, New Mexico, Colorado .... *nimius* Csy.

NOTES ON SYNONYMY AND DISTRIBUTION.

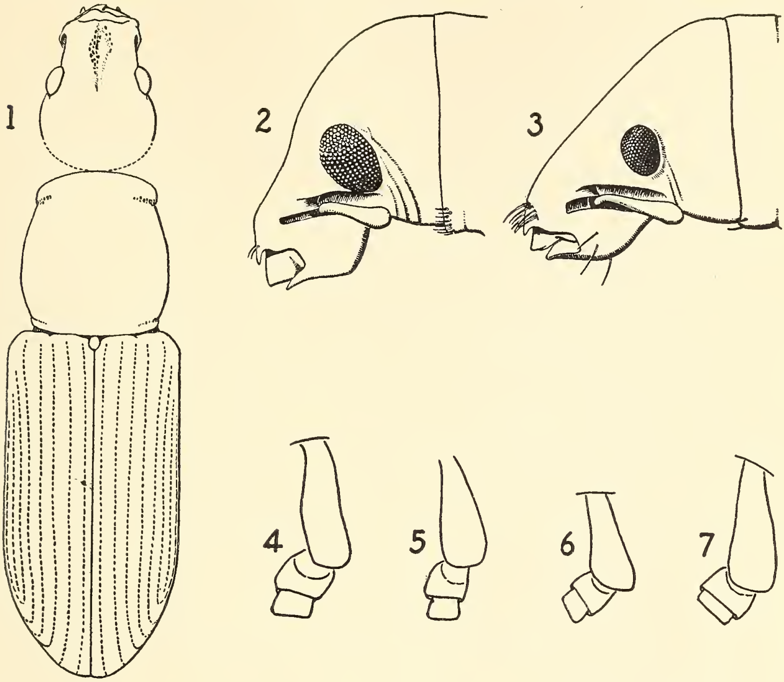
The three names preceded by an asterisk should be added to the American list. Synonyms are placed in parentheses.

(*Rhyncolus carinatus* Blatchley, 1916), type locality Kosciusko County, Ind., belongs in *Phloeophagus,* new combination, and = *Phloeophagus minor* Horn, 1873, described from Pennsylvania, District of Columbia, and Nebraska. New synonymy. I have examined the type of *carinatus* and authentic specimens of *minor.*

Rhyncolus (*relictus* Casey, 1892), type locality New Mexico, = *R. brunneus* Mannerheim, 1843, type locality Sitka, Alaska. New synonymy. Casey's three New Mexican examples of *relictus,* though smaller than the average sized *brunneus,* agree with small specimens of that species from other places. *R. brunneus* ranges from Alaska south to California, Arizona, and New Mexico and eastward, in Canada and the northern United States, to the Atlantic coast. No specimens have been seen from Minnesota or the Dakotas or adjoining parts of Canada, but this probably indicates incompleteness of collections rather than an actual break in distribution.

Rhyncolus (**Californicus* Wollaston, 1873), Ent. Soc. London, Trans., p. 645, type locality California, = *R. brunneus* Mann., 1843. New synonymy. A California specimen of *brunneus* agrees well with Wollaston's type of *californicus;* comparison made by Sir Guy Marshall.

*Rhyncolus *cylindricollis* Wollaston, 1873, l. c., p. 645, type locality California. In American collections this species has been confused with *R. oregonensis,* some specimens of which resemble it closely. Compared with *oregonensis* its smoother and more polished elytral intervals, and more sharply defined elytral carinae are often distinctive. Specimens of *cylindricollis* now at hand are from Lake Tahoe, Mariposa County, Big Tree Grove in Mariposa County, Yosemite Park, Truckee, Sisson, Monterey, and Pyramid Rangers Station, Calif.; Nevada; Hood River, Prineville, and Forest Grove, Oreg.; Longmire and Mount Adams, Wash.; Coeur d'Alene, Idaho; Salt Lake, Utah; and Sanca and Creston, British Columbia. Several records suggest that it sometimes occurs in association with *oregonensis.*



EXPLANATION OF FIGURES OF RHYNCOLUS.

FIG. 1.—Female *macrops,* Terrace, British Columbia. FIG. 2.—Same. FIG. 3.—Female *brunneus.* FIG. 4.—Scape and first two joints of funicle of male *macrops,* Terrace, British Columbia. FIG. 5.—Same for male *brunneus,* Rampart House, Alaska. FIG. 6.—Same for male *cylindricollis,* Lake Tahoe, Calif. FIG. 7.—Same for male *oregonensis,* Prineville, Oreg.

Rhyncolus oregonensis Horn, type locality Oregon, ranges from British Columbia south to California. Eastwardly a few specimens have been seen from Montana, Idaho, and Colorado. A short series from Black Hills and near Elmore, S. Dak., is tentatively referred to *oregonensis,* though the specimens are, in some ways, intermediate between *oregonensis* and *discors.*

Rhyncolus nimius Casey, type locality Las Vegas, N. Mex. Specimens examined from Williams, Flagstaff, Santa Catalina Mountains, and Chiricahua Mountains, Ariz.; Las Vegas, N. Mex.; and Colorado Springs, El Paso County, and Uncompahgre National Forest, Colo.

Rhyncolus discors Casey, type locality Crescent City, Fla. In the original description only Florida is mentioned, but Casey's type is labeled Crescent City, Fla. The smaller of Casey's two examples is 3 mm. long, the 2.8 mm. length stated by Casey evidently excluding the head. The few specimens of *discors* examined are from Bogalusa and Pouchatoula, La.; Crescent City, Baldwin, and Quincy, Fla.; Savannah and Milner, Ga.; Durham, N. C.; Onville and Falls Church, Va.; Berwyn, Laurel, and Glen Echo, Md.; McCullock's Mills, Pa.; and Grand Ledge, Mich.

*Rhyncolus *protensus* Wollaston, 1873, l. c., p. 647, type locality California. This species does not seem to be represented in the National Museum collection. It is described as black, shiny, and 2 lines long, the same length as stated for *cylindricollis.* The rostrum is longer than in *Cylindricollis* and *oregonensis* (*"longiusculo"*), and parallel-sided; and Sir Guy Marshall has informed me that the prothorax is subconical, the sides being straight in the anterior two-thirds, and without an apical constriction; also, that the punctures on the prothorax are much finer and sparser than in *Phloeophagus californicus* Van Dyke.

TWO APPARENTLY NEW GEOMETRID MOTHS FROM SOUTHERN CALIFORNIA.

By John L. Sperry, Riverside, California.

In February 1944, Canadian Entomologist, LXXVI, p. 33, the author, in revising the genus *Chlorosea* Pack., expressed the opinion that the differences of southern specimens of *banksaria* Sperry from the northern species, were too slight to warrant separation. Since the publication of this paper the author has collected additional material from the upper Santa Ana River in San Bernardino Co., Calif., and now considers that the differences which seemed slight with only two southern specimens for comparison, are very constant when seen in longer series. The author considers, since the southern specimens are readily separated both by maculation and by genitalia from their northern brethren, that the southern *Chlorosea* probably deserves specific rating and makes bold to describe,

Chlorosea gracearia, n. sp.

Both sexes: Palpi, bright rose; front ochreous, flecked occasionally with rose, a rosy area between and behind the antennae, which are creamy white; collar rose. Legs; femur and upper tibia clothed with green hair, tibia and upper tarsus bright rose on all legs. Thorax green (Ridgway's Civette Green in fresh specimens), abdomen pale green dorsally, dark green ventrally, the creamy spots ringed with rose decorating the first four abdominal segments dorsally. Wings, both primaries and secondaries, are immaculate green in four specimens of the type series, in four specimens the t.p. line on both wings is so fine it is barely indicated, position nearly as in *banksaria.* Beneath, immaculate green with the silvery ground color showing through, chiefly along the inner marginal areas of both wings. Lines, when present, and fringes silvery, shading into green. Expanse 26 to 30 mm. Male Genitalia: The differences in the genitalia of all *Chlorosea* species are slight, this species is closest to *banksaria* Sperry, differing in the following particulars: in *gracearia* the costal tooth is blunter than that in *banksaria,* the gnathos comes to a sharp point but lacks the sharp tip of *banksaria,* the aedeagus in *gracearia* is narrow, flaring slightly at the head and coming to a point on the right side of the organ, in *banksaria* the head is broader and the tip sharper. The teeth which decorate the two points on the edge of the 8th segment which are multiple in *banksaria,* in *gracearia,* consist of two long sharp teeth, one dorsally and one ventrally at each point. This is the surest character.

Holotype, female, Barton Flats, San Bernardino Co., Calif., Sept. 4, 1945 (G. H. & J. L. Sperry), in the collection of the author.

Allotype, male, Mt. Wilson, Calif., Aug. 9, 1913 (H. H. Newcomb).

Paratypes, 4 females, Barton Flats, Sept. 1, 3 and 10, 1945 (G. H. & J. L. Sperry); 1 female same locality, Aug. 4, 1945 (A. L. Melander); 1 female, Lake Arrowhead, San Bernardino Co., Calif., May 30, 1937 (H. Little).

It gives me great pleasure, to name this beautiful *Chlorosea,* shall I say, in honor of my wife, Grace Herreshoff Sperry? No. She has been honored by better entomologists than I, let me say rather in her honor and in happy remembrance of the great cloud masses that climb above the peaks, of soft breezes singing through the pines, of the scent of fresh pulled balsam, the path of moonlight on the water, the ethereal beauty of the hermit thrush at twilight and a coyote singing softly far away through a starlit, fragrant night and of all the good and simple things that make our memories of this, the land we love.

This species comes between *banksaria* and *roseitacta* Prout on the list and is separated by its smaller size, averaging 28 mm. to 36 mm. for *banksaria,* the entire or near absence of lines on the wings, the presence of dorsal spots on four abdominal segments to three in *banksaria.* In my specimens of *gracearia* the tibiae are bright rose, as is the collar also, in *banksaria* the tibiae are ochreous, tinged with light pink, and the collar is green. *Gracearia* is distinguished from *roseitacta* by the absence of the rosy streak on the inner margin of the secondaries and from other members of the genus by the presence of abdominal spots.

From the southern desert I have what appears to be a new Cleorid.

Stenoporpia crickmeri, n. sp.

Both sexes. Palpi, head and thorax pale ochreous buff, abdomen same, lightly flecked with deep brownish drab (Ridgway color). Wings, pale ochreous with a creamy cast, sprinkled and blotched, lightly or very heavily, with brownish drab, no lines definitely present but the blotches are arranged to indicate t.a., median and t.p. lines on both wings.

Primaries, basal area flecked with brownish drab, an irregular, small, triangular costal spot one-third out marks the beginning of the t.a. line, which, when traceable in irregular mottling, leaves the costa at an outwardly oblique angle to the cell, thence subparallel to the outer margin to inner margin. The median line, if such it can be called, starts two-thirds out on the costa, indicated by a small spot, sometimes absent, curves subparallel to the outer margin outside the distinct oval discal spot, turning inward along the lower edge of the cell, thence roughly parallel to t.a. line to inner margin at less than one-half out. There is a tendency to heavier mottling in the area between the t.a. and median lines in some specimens approaching the form of a loose fascia. The t.p. is best marked of all the lines, starting four-fifths out on the costa and running roughly subparallel to the outer margin, this series of large, irregular, toothed blotches makes an irregular band across the wing, outwardly edged with lighter scales. There is an irregular terminal dark hair-line with intervenular dots. Fringes ochreous tinged with drab.

The so-called lines are arranged on the secondaries as on the primaries. The discal dot is small, oval, solid and distinct. Beneath pale shining ochreous, discal spots and costal half of t.p. line showing faintly through. Expanse, male 26 to 29 mm.; female 25 to 29 mm.

Holotype, male, Borrego, Calif., March 1946 (Noël Crickmer), in collection Sperry.

Allotype, female, same data.

Paratypes, 3 males, 8 females, same data, Mar. & Apr. 1946 (Crickmer); 1 male, Borrego, Calif., Apr. 11, 1941, 1 female, Apr. 3, 1941 (G. H. & J. L. Sperry).

It gives me great pleasure to name this fine species in honor of my friend Noël Crickmer in recognition of my great indebtedness to him for many thousands of desert moths and in memory of certain beatings I have received from him across the chess board.

This species belongs in the *dionaria-pulchella* section of the genus and is closest to *pulchella* Grossb. but is smaller (27 mm. compared with 32 mm. or more) and lacks the rosy flesh color of Grossbeck's species, the t.p. line in *crickmeri* is nearer the outer margin and more diffuse than in *pulchella,* the discal spots are not ringed as in *pulchella* and beneath show only faintly whereas in *pulchella* the dots are large and distinct, and finally in *crickmeri* the male antennae are pectinate to the end whereas in all other members of the group the last mm. or more of the antennae are simple. This feature made the author doubtful as to the generic reference but the male genitalia are Stenoporpian.

A NEW RHABDOPTERUS FROM TEXAS (COLEOPTERA, CHRYSOMELIDAE).

By H. S. Barber, Bureau of Entomology and Plant Quarantine,
Agricultural Research Administration, United States
Department of Agriculture.

Except for the few samples mentioned herein very little new information on *Rhabdopterus* has come to notice since my discussion in 1943 (Bul. Brooklyn Ent. Soc. 38: 111–120) of the confusion and uncertainties found in the poorly preserved and otherwise inadequate samples from our area. Two samples from San Antonio, Tex., received through routine official channels in 1943 and 1946, followed by better samples from Menard, Tex., include males so well preserved in alcohol that when dissected the obvious peculiarities of their aedeagi prevent their identification as *R. praetextus* (Say), which they otherwise resemble. These differences are indicated in the accompanying diagrams and offer almost the only characters observed which seem of value for identification.

Concepts of specific or subspecific status of superficially similar but distinguishable forms are changing. The relative constancy in the form of the aedeagus of *praetextus* throughout its great area of habitat seems to exclude the San Antonio samples, although *praetextus* appears to be abundant from the mouth of the Rio Grande to Quebec. The following appears to be the seventh species of *Rhabdopterus* distinguishable in the material now available, but our area is still very inadequately sampled.

Rhabdopterus bottimeri, n. sp.

Very similar to *R. praetextus* (Say). Differs in the form and proportions of the aedeagus, which is longer and apparently narrower with the produced apical process longer and concave with a slight median carina near tip as indicated in figure 1, D. In the aspect shown in this figure the width is distinctly less than half (only 3/7) of the length from base of dorsal sclerotization to base of the apical process, whereas in *praetextus* the width is distinctly more than half (about 3/5) of its length. The legs and antennae pale, the latter rarely showing infuscation of joints 7, 10, and 11, as in related species, the hind tibia relatively longer, more curved and narrower in middle third, more abruptly broadened apically, measuring, length 1.7 mm.; width at apex 0.3, at base 0.15, at middle 0.18, whereas in *praetextus* these measurements are 1.45, 0.22, 0.12, 0.18 respectively. Length 5–6 mm., width across humeri 2.5–3 mm.

Type ♂, 31 ♂ and 48 ♀ paratypes, Menard, Tex., April 28, 29, May 1, 2, 10, 26, 28, 1946, most of them from *Cephalanthus occidentalis,* several on *Polygonum* sp., a few on sycamore and willow, L. J. Bottimer; 3 ♂ and 2 ♀ paratypes on rose leaves and flowers, San Antonio, Tex., April 8, 1946, Wm. R. Walton, Jr.; 3 ♂ and 2 ♀ paratypes on *Camellia japonica,* San Antonio, Tex., April 23, 1943, H. C. Glover; 1 ♂ paratype, Sabinal, Tex., May 1910, F. C. Pratt; 1 ♂ paratype on lettuce from Mexico, intercepted at Del Rio, Tex., May 16, 1942.

Type ♂ and 86 paratypes, United States National Museum No. 57983; 5 ♂ and 5 ♀ paratypes returned to Mr. Bottimer.

Mr. Bottimer writes that both of the principal hosts were single plants showing considerable damage and that during daylight the beetles were under leaves at their bases, but that after dark they were feeding on the tender young foliage. Pressed samples of injured leaves show very numerous round or elongate holes from 2 to 5 mm. wide and up to 25 mm. long.

Among the several well-preserved alcoholic samples sent by Mr. Bottimer, a male with nearly full evagination of the internal sac and a pair in coitus are of especial interest as they show structures hitherto not described in the Eumolpinae. The internal sac is illustrated in Figure 1, A, B, C, while dissection of the pair showed the function of this complicated organ. When extended the ovipositor is a very slender long cylindrical, mostly membranous organ, 7 mm. long and about 0.6 mm. in diameter, the vestigial sclerites and spiracle of segment 8 with its basal intersegmental membrane comprising its basal half and the sclerites of segment 9 with its long intersegmental membrane composing its apical half. The genital opening, is between the bases of the apical processes with the anus above it covered by a sclerotized median process of segment 9. When withdrawn in its normal position these two segments telescope one into the other and in this position the basal flanges of the internal sac probably unfold outwardly as holding organs followed gradually by membrane and the large pair of lobes and sclerites in the median portion of the internal sac. These structures envelop and hold the tip of the ovipositor so that continued evagination of the apical half of the internal sac may be within the vagina. This was the position found in the dissected pair, the large lateral processes embracing segment 9 as it was withdrawn inside its basal connecting membrane, with the subspherical apical swelling of the internal sac in the vagina well beyond the base of the sclerites of segment 9, its functional orifice apparently at the orifice of the duct leading to the *receptaculum seminis.* But when this preparation was cleared the very long and fine sclerotized seminal duct described in a previous paper (Memorias, Soc. Cubana de Hist. Nat. 18: 19–20) was not found to be extruded, probably having been withdrawn during the death struggles. This remarkable hairlike tube is present in several subfamilies of Chrysomelidae (cassidines, hispines, eumolpines, chlamisines, cryptocephalines, etc.) but seems to be absent in the typical subfamily Chrysomelinae, as well as in the galerucines and alticines.

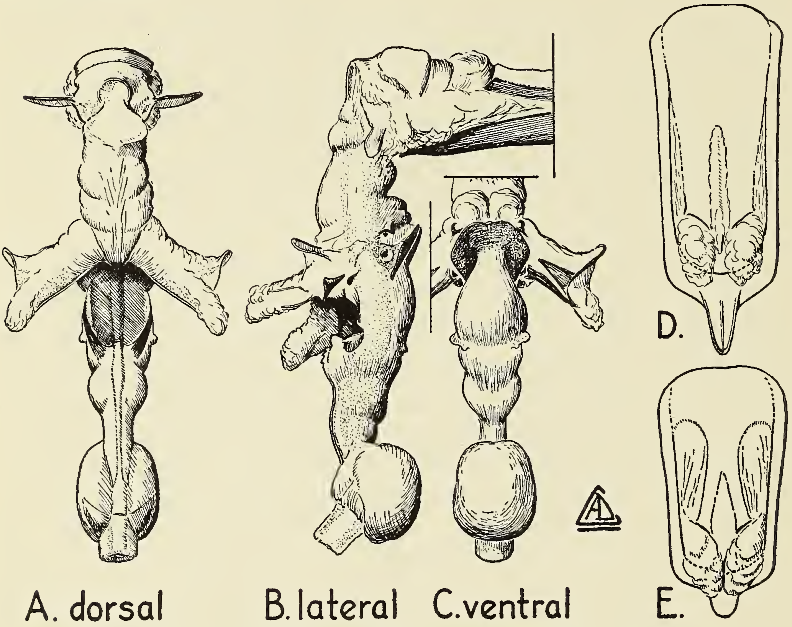


FIG. 1. A, B, C, internal sac of *Rhabdopterus bottimeri,* n. sp. D, orificial aspect of aedeagus of same with sac invaginated. E, same aspect of *R. praetextus.* Drawn by Arthur D. Cushman.

THE JAPANESE WEEVIL, PSEUDOCNEORHINUS BIFASCIATUS ROELOFS, IN AMERICA (P. SETOSUS OF AMERICAN RECORDS, NOT ROELOFS) (COLEOPTERA, CURCULIONIDAE).

By L. L. Buchanan, Washington, D. C.

This weevil, originally described from Japan, was first recorded from North America by Britton (Conn. Agr. Expt. Sta. Bull. 256, pp. 313–314, 1923; published February 1924) who reported that several specimens of *Pseudocneorhinus setosus* had been collected on burr marigold, *Bidens* sp., in the New Haven Nurseries at New Haven, Conn., in 1920, 1921, and 1922. Two other published notes by Britton, one in 1932 (Jour. Econ. Ent., vol. 25, No. 4, p. 931), the other in 1933 (Conn. Agr. Expt. Sta. Bul. 349, pp. 434–437) mention damage done by the weevil to Japanese barberry, California privet, lilac, and hemlock at West Haven, Conn. Additional records taken from specimens in the National Museum Collection are as follows: Philadelphia, Pa., August 3, 1914, found in Dreers Nurseries; Lansdowne, Pa., June 2, 1940; Queens Village, Long Island, N. Y., August 1, 1940, on forsythia and other plants; Far Rockaway, N. Y., September 28, 1942, damaging barberry, azalea, and other plants; Washington, D. C., July 1946, feeding on leaves of lima beans; Moorestown, N. J., July 1946, damaging privet hedge. There is also a specimen in the collection of Ernest Shoemaker, taken at Germantown, Pa., July 22, 1944.

By Marshall's key to the species of *Pseudocneorhinus* (Arkiv för Zoologi, Band 27 A, No. 29, 1934, p. 8 of separate), all American specimens I have seen, including several from New Haven, Conn., trace to *P. bifasciatus* Roelofs, and they also agree with a Japanese specimen of this species now in the National Museum Collection. The scientific name of the species present in America should therefore be changed from *P. setosus* Roelofs to *P. bifasciatus* Roelofs. *P. bifasciatus* differs from other members of the genus by having denticles on the lower edge of the hind tibiae.

Altogether, 83 American specimens of *bifasciatus* are at hand. Of these, 55 (the entire series from Moorestown, N. J.) are unquestionably females (all dissected). None of the remaining 28 has yet been dissected, but, by external characters, they also appear to be females. It thus seems not improbable that the species is parthenogenetic.

EDITORIAL.

ON SEEING THINGS.

One of the most striking aspects of early descriptions of insects is not their inadequacy or incompleteness, but rather how much the early describers saw with very deficient equipment in comparison with that of the present. Now we see far more structures than Fabricius did or could see.

The lenses used to the middle of last century, or even later, have since been vastly improved, not alone as to the technique of grinding, or in the formula for sphericity, but even in the composition of the glass itself. Also, we moderns use habitually the stereoscopic binocular, with which it is possible to see far more, at higher magnifications, and in proper perspective and relationship.

The true defect of the early describers was not their superficiality, a natural condition when we consider the relative fewness of the forms they had before them, but that nowhere is anything said of the magnification at which they had seen the structures named in the description. It follows that when we moderns employ high powers, we very naturally detect in an insect structures not seen a century ago by the original describer, and thus are able better to discriminate between any two closely related forms.

The modern entomologist, in the face of these refinements and acuities of visual perception, is placed now in the position where in every description the magnification should be clearly stated; and if any particular structure is revealed best at any other magnification than that of the body of the description, it should be plainly stated; and both of these should be deemed parts of a description.

Naturally, the above remarks do not cover points of technique, of lighting, or of orientation, every one of which has an important part in seeing things.

J. R. T.-B.

June Bulletin: Actual Date of Issue—Bibliographers please note that the Bulletin of the Brooklyn Entomological Society for June 1946, vol. XLI, no. 3, pp. 65/104, was mailed on *July 22, 1946*.

BOOK NOTES.

Check List of the Cicadellidae (Homoptera) of America, North of Mexico, by Dwight M. DeLong and Dorothy J. Knull. Pp. 1–102. Graduate School Studies. Biological Science Series No. 1. Ohio State University, Columbus, Ohio. Price $1.50.

This highly useful work is a revision to May *1945* of DeLong & Caldwell's list of 1937, which was the first attempt to bring together the species in the Cicadellidae, of which so very many were new since the Van Duzee Catalogue of 1917.

In 1937, 145 genera and some 1800 species were listed. As of 1945, the Introduction states:

"The present list contains 175 genera and 2276 species, varieties and subspecies occurring north of Mexico. Those species previously listed which occur only in Mexico have been omitted. Recent generic revisions and other work upon synonymy have been used in an attempt to arrange these species and genera more adequately in accordance with their structural characters.

"As in the previous list synonymy of the Van Duzee Catalogue has not been repeated, but recent synonymy has been indicated as far as possible by indenting and printing in Italics the name placed in synonymy. Previous errors and omissions have been corrected and all described genera and species added to May, 1945."

A formal critique of this excellent catalogue would go far beyond the purpose and scope of these Book Notes. But the present reviewer fully appreciates the endless and painstaking drudgery such work entails, from his own personal experience. Users of careful works such as the one above are not always alive to this meticulous detail, but they are very much awake to slight imperfections. Let us all, rather, consider the selfless labor of such authors, for the good of all.

The Naturalists Directory, Salem, Mass. 1946. Price, $3.

This note is to herald the appearance in September of this year, of this directory, for the 60th consecutive year. In this day of high prices, it is agreeable to see it still sells for $3.

From Universitets Zoologiske Museum, of Oslo, Norway, we have received nos. 3 and 4 of Norsk Entomologisk Tidskrift, for 1945. This publication of the Museum is on an exchange basis only, and is dedicated to Norwegian insects or to collections in Norwegian Museums, in 4–6 parts to the volume, over two years. Articles are in Norwegian, English, French or German, or summarized in the latter three languages. The number before us has articles in Norwegian and English on Coleoptera, Neuroptera, Diptera, Heteroptera and Homoptera. J. R. T.-B.

PROCEEDINGS OF THE SOCIETY.

Meeting of December 13, 1945.

The meeting opened at 8:20, Pres. McElvare in the chair. Members in attendance were Messrs. McElvare, Naumann, Buchholz, Teale, Sheridan, Noaks. The minutes of October and the previous meeting were approved as read. The Treasurer mentioned an increase in the demand for the Bulletin. Mr. McElvare made a motion to the effect that a 25% discount be made for the Bulletin under the following circumstances: United Nations having subscribed to the Publications and because of the war were unable to receive their copies are entitled to this discount. The motion was seconded and carried. Mr. McElvare also stated that he had received a letter of thanks from The London Zoological Society for our donation. The following members were appointed to the nominating committee: Sheridan, chairman, Buchholz and Naumann.

Mr. Buchholz delivered the paper of the evening on his experiences in the Dismal Swamp of Virginia. During his talk he described Drummond Lake and the Jericho and other deep ditches which were constructed by farmers for protection against floods. Mr. Buchholz mentioned the extremely heavy foliage and densely wooded forests in the dryer parts of the swamp. He stated the only flower plentiful in the swamps was a species of *Prunella*. Among the fauna, Mr. Buchholz mentioned seeing several land turtles, bears, black snakes, and water moccassins in addition to the many deer flies and species of Lepidoptera which he had collected. Special emphasis was placed on the large number of ticks throughout the swamp.

The meeting was adjourned at 10:00 P.M.

John W. Noaks, *Secretary.*

Meeting of January 10, 1946.

The annual meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on January 10, 1946. The meeting opened at 8:15 P.M., Pres. McElvare in the chair. Members in attendance were Messrs. McElvare, Buchholz, Naumann, Teale, Sheridan, and Noaks.

The minutes of the previous meeting were approved as read.

The Treasurer submitted the financial report of the Society for the period from Oct. 1–Dec. 31 and the annual report, both of which were accepted by the Society.

The report of the Publication Committee was presented and accepted with thanks. Particular appreciation was expressed regarding the services of the Editor. On motion duly seconded it was resolved to appropriate one hundred dollars towards the expenses of the Editor in 1945.

The Society recognized with regret the passing of Mr. Fred M. Schott, a former member of the Society, and Mr. Charles Rummel both residents of New Jersey.

The report of the Nomination Committee as submitted by Mr. Sheridan was as follows: For Pres. and Treas.—Mr. McElvare; Vice-Pres.—Mr. Buchholz; Sec.—Mr. Noaks; Delegate to N. Y. Academy of Sciences—Mr. Teale; Publication Committee—Mr. Bueno, Editor, Mr. Teale and Mr. Noaks; Executive Committee—Mr. Teale, Mr. Naumann, and Mr. Buchholz; Program Committee—Mr. Sheridan, Mr. Teale, Dr. Goodnight; Curator of Memorandums—Mr. Noaks.

The meeting adjourned at 9: 30 P.M. following a general entomological discussion.

JOHN W. NOAKS, *Secretary.*

MEETING OF FEBRUARY 14, 1946.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on February 14, 1946. The meeting was opened at 8: 15 P.M., Pres. McElvare in the chair.

Members in attendance were Messrs. R. R. McElvare, Naumann, Buchholz, Moennich, Sheridan, Teale, Noaks and Drs. Tulloch and Goodnight. Visitors included: Dr. G. W. Rawson, ex-chairman of the Detroit Entomological Society; Messrs. E. G. Smyth, J. C. King, F. Rose, and Mrs. Goodnight and Miss S. Williams.

The minutes of the previous meeting were approved as read.

The Treasurer's report was accepted by the Society.

The report of the Nomination Committee, held over until a quorum met, was ratified by the Society.

A resolution honoring the memory of Charles Rummel was drawn up by Mr. Buchholz and will appear at the close of the minutes.

The following addition was made to the Long Island Records: Mr. McElvare reported that Roy Latham of Orient, on Aug. 26, 1945, had taken three specimens of *Schinia tuberculum* Hbn. in the woods west of Round Pond, Sag Harbor—a new locality for this species. On Sept. 9, Mr. Latham also took *S. tuberculum* and *Eupanychis spinosae* Gn. at Hither Beach, Montauk—a new locality for both species and a record *late* date for *tuberculum* on Long Island.

The speaker of the evening was Mr. Buchholz who delivered a most interesting talk on his unusual collecting equipment. During his lecture Mr. Buchholz demonstrated several pieces of apparatus of which three will appear in the Bulletin, illustrated with an accompanying description.

The meeting adjourned at 10: 15 P.M. after a general discussion.

JOHN W. NOAKS, *Secretary.*

MEETING OF MARCH 14, 1946.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on March 14, 1946. The meeting opened at 8: 00 P.M., Pres. McElvare in the chair.

Members present were Messrs. McElvare, Gaul, Sheridan, Noaks and Dr. Tulloch.

The minutes of the previous meeting were approved as read.

Mr. McElvare reported briefly on a visit with Dr. Bequaert in Boston, Mass. He also mentioned seeing Dr. Dietz's collection of lepidoptera which is for sale and is most excellently represented by American Sphingidae and exotic Papilios.

The speaker of the evening was Dr. George S. Tulloch who reported informally on his experiences as a navy entomologist during World War II and presented a paper entitled: DDT—A new weapon in insect control, which will appear in full in the Bulletin.

JOHN W. NOAKS, *Secretary.*

Entomologica Americana, Mailing Date—The actual mailing date of no. 3, vol. XXVI (n.s.), is October 1, 1946 (not September 20). This is the number for July, 1946.

Vol. XLI DECEMBER, 1946 No. 5

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BULLETIN

OF THE

BROOKLYN ENTOMOLOGICAL SOCIETY

Vol. XLI December, 1946 No. 5

THE GENUS DIACRITA GERSTAECKER (DIPTERA, OTITIDAE).

By George C. Steyskal, Detroit, Michigan.

The following notes on the little-known genus *Diacrita* are the result of an effort to ascertain in what manner a new species here described differs from the two previously described.

Genus *Diacrita* Gerstaecker.

Diacrita Gerstaecker, Stettiner Ent. Ztg. 21: 195, 1860; Loew, Monogr. Dipt. No. Amer. 3: 111, 1873; Hendel, Abh. Zool.-Bot. Ges. Wien 8: 123, 1914; Hendel, Gen. Ins., Fasc. 157, 1914 (genotype, *D. costalis* Gerst.).

Carlottaemyia Bigot, Bull. Soc. Ent. France 1877: 26 (*C. moerens* Bigot = *Diacrita costalis* Gerst.; syn. by Bigot).

The characters cited in the following paragraphs appear to be common to the species and are presented as complementary to the few published descriptions.

Thoracic chaetotaxy: 1 humeral, 2 notopleural, 2 supra-alar, 1 postalar (occasionally duplicate), 2 posterior dorsocentral (anterior much the smaller), 1 prescutellar acrostichal, 1 apical scutellar, 1 lateral scutellar practically dorsal in position, 2 or 3 posterior marginal mesopleural, 1 sternopleural, 0 propleural or stigmatal bristles. A tuft of strong hairs is present in the middle of the propleura and there are a few weak hairs laterally on the prosternum.

A peculiar configuration is visible on both sides of the third antennal joint in the female (cf. figures). The boundaries of the "lobes" seem to be impressed lines rather than sutures. They are scarcely distinguishable in the male. Their contour presents specific differences.

Dark chocolate-brown spots on the mesonotum. They are called black by Gerstaecker and Loew and are not very conspicuous, especially in the new species. They vary from 4 to 6 presutural (the middle pair frequently lacking), and the single postsutural pair is often almost indistinguishable.

Diacrita aemula Loew, Monogr. No. Amer. Dipt. 3: 114, 1873.

The writer has seen no material which he could refer to *D. aemula,* although he has seen a number of specimens from its type locality, "California." It may be that it and *D. costalis* are conspecific, as Hendel would seem to infer (1914: 123): "Präzise Unterschiede von der vorigen Art (*D. costalis*) kann man aus Loew's Angaben nicht herausfinden. Ich möchte hier nur bemerken, dass es auch Stücke von *D. costalis* Gerst. gibt, deren Allgemeinkolorit ebenfalls ockergelb genannt werden muss. Ebenso zählte ich bei *D. costalis* Gerst. vor der Naht nur fünf schwarze Flecke, wovon der vorderste nur sehr klein war. Auch die zwei Punkte hinter der Quernaht sind manchmal ziemlich klein."

Diacrita costalis Gerstaecker, Stettiner Ent. Ztg. 21: 197, 1860 (a)[1]; Bigot, Bull. Ent. Soc. France 1877: 38, cxxxii; Giglio-Tos, Ditteri del Messico, Mem. R. Accad. Sci. Torino 45, 1895; Coquillett, Jour. N. Y. Ent. Soc. 12: 32, 1904 (b); Sturgis, Jour. Ent. Zool. (Pomona) 10: 27, 1918 (c); Cole, Proc. Calif. Acad. Sci. (4) 12: 475, 1923 (d); Enderlein, Mitt. Zool. Mus. Berlin 11: 115, 1924 (e); present paper (0).

Head in profile as in fig. 2a; front strongly sunken, pruinose only medianly, laterally strongly shining. A white-pruinose stripe extends from eye to eye across the parafacials and face, interrupted broadly in the middle of the face and narrowly at both margins of the parafacials. A rather narrow stripe of white pruinosity follows the posterior orbit, interrupted just below middle of eye, and continues downward rather indistinctly to oral margin.

Scutellum shining or faintly pruinose, contrasting with the heavily pruinose mesonotum, with a pair of blackish marks beneath tip.

The following material has been examined. In the United States National Museum—MEXICO: San Luis Potosí, ♀, Aug. 21, 1930 (R. Mundell); Aguas Calientes, ♂, Dec. 1, 1909 (F. C. Bishopp); Chapingo, 2 ♂, Oct. 15, 1937 (L. H. Olmeda); TEXAS: Uvalde, ♀,

---

[1] The letters in parentheses refer to localities cited and appear on the map, fig. 1.

Jan. 6, 1936, ♂, Nov. 12, 1935 (C. C. Deonier); Sonora, ♂, June 11, 1920 (Bishopp No. 9719); Brownsville, ♀, April (Brooklyn Mus. Colln. Cat. No. 1333); Sinton, ♀, Feb. 7, 1911 (C. T. Atkinson); Knippa, ♂, July 24, 1910 (F. C. Pratt); Sabinal, ♂, March 6, 2 ♂, March 9, 1910 (F. C. Pratt); San Diego, ♀, March 25, 1908 (Jones and Pratt); ARIZONA: Hot Springs, ♀, June 22, 1901 (H. S. Barber); CALIFORNIA: Whittier, ♂, May 28, ♀, June 6, 1931 (Chas. H. Martin); Los Angeles, 3 ♂, 1 ♀, (Colln. Coquillett/CH); San Diego, ♂, Sept. 5, 1919, reared from decaying cactus (F. Psota). In University of Kansas—MEXICO: Gnito, ♀; CALIFORNIA: Whittier, ♂, May 27, ♂, June 5, ♀, June 6, 1931 (Chas. H. Martin); NO LABEL: 3 ♂. In Ohio State University—CALIFORNIA: San Diego Co., ♂, July. Total, 20 ♂, 10 ♀.

Diacrita plana, n. sp. Fig. 2b.

Male and female. Length, body and wings, each 7–8 mm.

The greatest differences from *D. costalis* are in the head: the eyes are rounder, the face flatter transversely, and the occiput less swollen. Front flat to gently convex. Whole head pruinose except lower face and below eyes. Approximately the upper half of the face is white-pruinose in entire width. Dark brown orbito-antennal spot very small.

Thorax and abdomen apparently reddish brown under the dense, slightly yellowish, gray pruinosity. Head, humeri, scutellum, hypopygium (♂), ovipositor (♀), and appendages yellow. Head a little darkened on sides of front and upper lateral parts of occiput. Abdomen subshining. Scutellum scarcely less pruinose than mesonotum and lacking the pair of blackish spots beneath that is seen in *D. costalis*.

Color pattern of wings paler than in *D. costalis,* brown rather than blackish, filling humeral and subcostal cells and stigma (although quite dilute in middle of subcostal cell and at base of stigma), filling tip of marginal cell three-fifths of distance to stigma, and filling tips of submarginal and first posterior cells almost as in Loew's figure of *D. aemula,* but the color is practically disjunct at tip of second vein from that in tip of marginal cell. Triangles of brown extend posteriorly from apical third of subcostal cell to a point in first basal cell and from apical half of stigma to second vein. Noticeably lacking is brown coloration posterior to radial stem vein at base of wing and in submarginal cell except for a short distance basally and apically. The remainder of wing is practically hyaline. Stigma slightly longer than half the length of subcostal cell.

Ultimate and penultimate sections of fourth vein equal. Ultimate section of third vein evenly forwardly arcuate in its entire length, except at extreme tip. Fourth vein curving forward

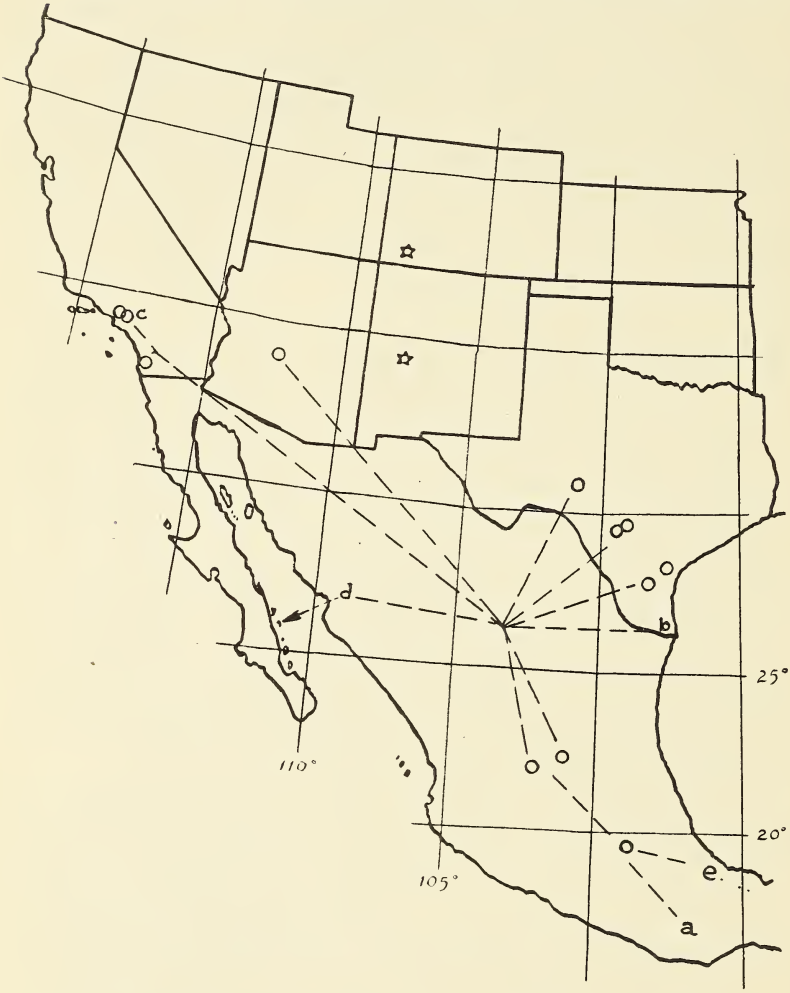

FIG. 1. Distribution of *Diacrita* spp. ★, *D. plana* n. sp.; a–e, o, *D. costalis* Gerst. (see text). *D. aemula* is known only from the type from "California." Under *D. costalis* the Bigot reference cites "Mexico," and the Giglio-Tos locality, Huastec, probably refers to the Huasteca country between San Luis Potosí and Tampico, Mexico.

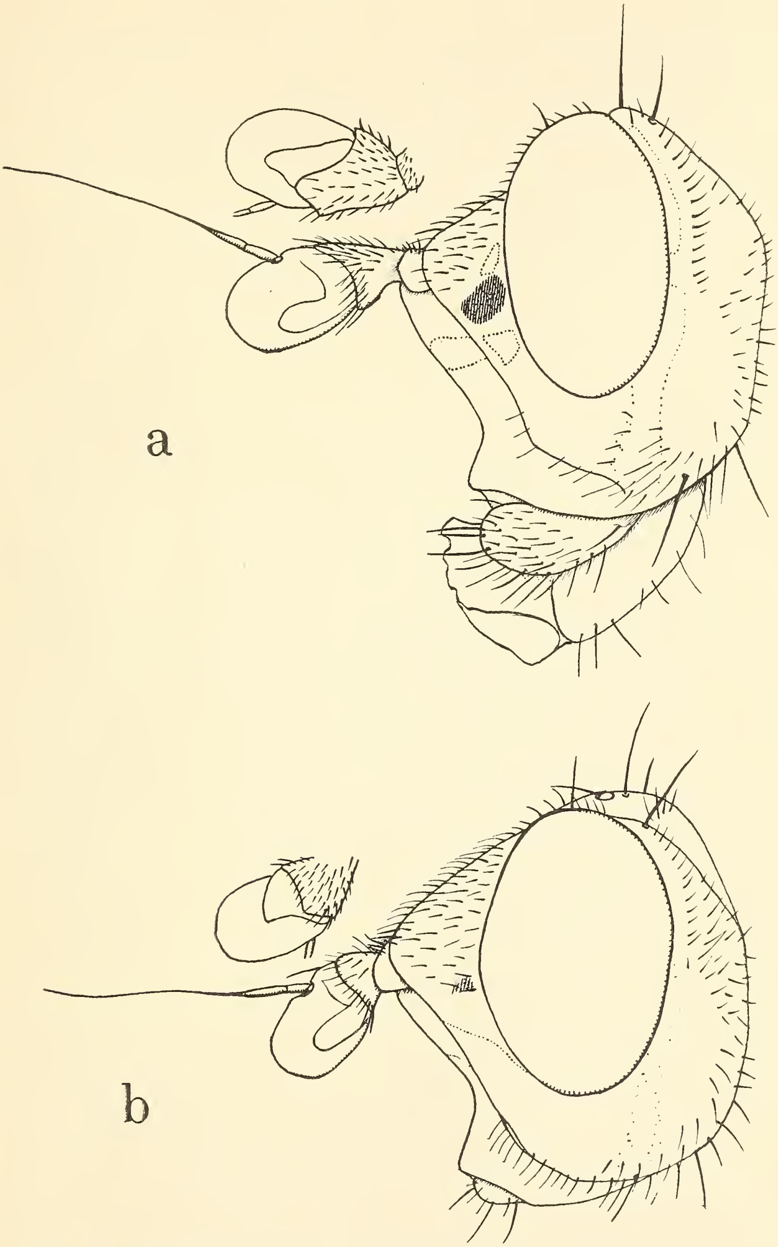

Fig. 2. Profile of heads of *Diacrita* spp., ♀. Dotted lines indicate limits of white-pruinose areas. (a) *D. costalis* Gerst.; (b) *D. plana,* n. sp.

only slightly each side of anterior crossvein (as in Loew's figure of *D. aemula*). Posterior crossvein scarcely sinuate above, but rather gently concaved into discal cell.

Holotype ♂, allotype ♀, and two ♀ paratypes, Magdalena, New Mexico (Strickler); 1 ♀ paratype, Durango, Colorado, June 6, 1899; all in Ohio State University collection, except one Magdalena paratype retained by the author.

The writer wishes to express his sincere thanks to C. F. W. Muesebeck and his colleagues in the Diptera division in the United States National Museum, to C. H. Kennedy and J. F. Knull at Ohio State University, and to H. B. Hungerford and R. H. Beamer at University of Kansas for their many courtesies.

Cuterebra Larvae in a Domestic Cat in Indiana (Diptera).—In 1925 (Jour. Econ. Entom., XVIII, pp. 331–334) Maurice C. Hall summarized what was known at the time of the occurrence of cuterebrid larvae in domestic cats and dogs in North America. Additional cases have been reported since by E. F. Knipling and W. G. Bruce (1937, Ent. News, XLVIII, p. 156) and by H. T. Dalmat (1943, Jour. Parasitol., XXIX, pp. 311–312). I have recently received from Dr. J. H. Sandground, of the Lilly Research Laboratories, three small bot-fly larvae of the genus *Cuterebra*, extracted from a subcutaneous abscess in a cat at Indianapolis, Indiana, on July 30, 1946. These larvae appear to be in the second instar. In the relatively few cases when the particular stage was mentioned, the larvae previously found in cats were also in the second instar. I was unable to determine the species of *Cuterebra* responsible for the Indianapolis infestation. It cannot be referred to either *C. buccata* or *C. cuniculi*, the second instars of which were described and figured by E. F. Knipling and A. L. Brody (1940, Jour. Parasitol., XXVI, pp. 33–43). In most of the published cases of cuterebrid infestations of cats, no specific identification was attempted. H. T. Dalmat (1943, *op. cit.*), however, states that at Ithaca, New York, house cats were infected with *Cuterebra horripilum* Clark. Mr. Dalmat has kindly informed me that this identification was based, not on a bred adult fly, but on the characteristics of the larvae. It would appear that more precise comparative studies of the several larval instars of our eastern Cuterebridae should be made before the identity of the species infecting domestic cats can be definitely settled. We are also as yet almost completely in the dark as to the manner in which cats may acquire this type of parasite.—J. BEQUAERT, Museum of Comparative Zoölogy, Cambridge, Mass.

SOME OBSERVATIONS ON THE GENUS LEPTOMORPHUS WITH A DESCRIPTION OF A NEW SUBSPECIES.

By F. R. Shaw, Amherst, Mass.

In October, 1942, Dr. A. B. Gurney, then attached to the station hospital at Camp Crowder, Missouri, collected some large fungus gnats which appeared to be of considerable interest. He forwarded the specimens for identification. There were four specimens, three males and one female, all belonging to the genus *Leptomorphus*. These specimens exhibited some differences in markings and not until I had made comparisons with material at the Museum of Comparative Zoology was I able to make a decision as to the correct classification. It is considered that the specimens represent a new subspecies of *Leptomorphus subcaeruleus* which I take pleasure in naming *gurneyi* as a token of appreciation for the many kindnesses Dr. Gurney has extended to me.

Leptomorphus subcaeruleus gurneyi, n. subsp.

Length 11 mm:

Head. Antennae with first five flagellar segments dark brown, basal half of the sixth and remaining flagellar segments yellow. Occiput dark brown, this color extends anteriorly to just beyond the ocelli which appear to be white. Remainder of the face including the palpi yellow. Thorax brown. Mesonotum dark brown. One specimen had yellow markings on the humeri resembling those of *subcaeruleus.* The other specimens had the mesonotum entirely dark with the exception of one specimen which had a pair of minute yellow spots over the wing base. Legs. Prothoracic coxae yellow, only faintly tinged with brown at the base. Trochanters and femora yellow, tibiae and tarsi dark brown. Mesothoracic coxae brown on the basal half, distal half, trochanters, femora and tibiae yellow. Tarsi brownish yellow. Metathoracic coxae brown on basal two thirds, distal third, trochanters and both apical and proximal parts of femora yellow. Tibiae yellow with small black spines. Tibial spurs yellow. Tarsi yellow with a dense covering of silvery hairs. Wings. Banded similarly to those of *nebulosus* Walk. but the tip of the wing not as clearly covered by a brown band. Wing length and body length subequal. In *nebulosus* Johannsen 1910, states that the ratio of body length to wing length is 10–16. The *r-m* crossvein is only about 1/4

> the length of the petiole of M. This differentiates this species from *nebulosus* Walk. where these two elements are subequal. In *walkeri* Curtis, the *r-m* crossvein is about 1/3 the length of the petiole of M but this species lacks bicolored antennae. Abdomen. Reddish. Basal segment reddish brown, darker than the others. Hypopygium yellow resembling that of *Leptomorphus subcaeruleus pulcher* (Joh.).

Since some changes have occurred following Johannsen's Monograph of the Mycetophilidae, it will not be amiss to review briefly the literature covering the North American species of this group.

The genus *Leptomorphus* was erected by Curtis in 1831. *Leptomorphus walkeri* is considered to be the genotype. In 1911, Johannsen recognized three species, *hyalinus* Coq., *walkeri* Curtis and *ypsilon* Joh. as occurring in North America.

The genus *Diomonus* was erected in 1848 by Walker. *Diomonus nebulosus* Walk. was the genotype. Johannsen, 1910, recognized five species, *bifasciatus* Say, *magnificus* Joh., *nebulosus* Walk., *pulcher* Joh. and *subcaeruleus* Coq. as occurring in this country. Johannsen apparently recognized that *Diomonus* was closely related to *Leptomorphus* for he states—

> "With the exception of the presence of R_{2+3} in the wing of Diomonus, the two are very similar in structural characters."

He further states that one specimen of *Diomonus pulcher* lacked R_{2+3} and hence would have been classified as belonging to *Leptomorphus*.

Edwards, 1924, makes the following comment relative to these two genera—

> "Since there is no essential difference between Diomonus and Leptomorphus I would propose to unite the two, the North American species described as Diomonus being evidently nothing more than species of Leptomorphus which have retained R_4."

It may be well to indicate that Edwards considered that the first branch of the radial sector in the Mycetophilidae was R_4.

Both the author and Fisher have followed Edwards' classification in regard to the union of *Leptomorphus* and *Diomonus*.

Further investigations by Fisher have made necessary a reclassification of the species. Based on studies of male genitalia, Fisher, 1937, considers that *pulcher* Joh. and *magnificus* Joh. are varieties of *subcaeruleus* Coq. These investigations are based on the types of *pulcher* and *magnificus* and a specimen of *subcaeruleus* from Johannsen's collection. Accordingly the present grouping would be as follows:

Leptomorphus subcaeruleus gurneyi n. subspecies
Leptomorphus subcaeruleus magnificus (Joh.)
Leptomorphus subcaeruleus pulcher (Joh.)
Leptomorphus subcaeruleus subcaeruleus (Coq.)

A study of members of this group indicate considerable variation in markings. The new subspecies possesses other characteristics sufficiently distinct to give it recognition even though it is not a new species. In Johannsen's key, the new subspecies would, on antennal coloring, be determined as *nebulosus*. It differs from *nebulosus* in wing venation and color pattern of the wing. The specimen of *nebulosus* which I saw at the Museum of Comparative Zoology had no yellow markings on the mesonotum. Two of the specimens I have reveal the presence of yellow markings but they are not the same. In Fisher's key, 1937, the specimen would be identified as either *nebulosus* or *walkeri*. The latter species lacks bicolored antennae.

A study of the male genitalia revealed that, based on these characters, there was not sufficient differentiation to justify the establishment of a new species. The structure of the hypopygium of *Leptomorphus subcaeruleus gurneyi* can be considered to be identical to that of *pulcher* Joh. as far as any practical variations are concerned.

***Aëdes aegypti* (Linnaeus), the Yellow Fever Mosquito, in Arizona (Diptera).**—According to the latest account of the mosquitoes of the southeastern United States, by S. J. Carpenter, W. W. Middlekauff, and R. W. Chamberlain (1946, Amer. Midland Naturalist, Monogr. No. 3, p. 230), *Aëdes aegypti* is known to extend westward to New Mexico; but it has not been recorded as yet from Colorado, Utah, Arizona, and California. It appears, however, to be well established in at least one locality in southern Arizona. Mr. J. R. de la Torre-Bueno recently sent me a male caught in his house at Tucson, on October 15, 1946. He writes me that this mosquito is well known by some of the local entomologists, being fairly common in summer and often annoying indoors through its persistent and elusive attacks around the ankles. It often bites during the daytime and is essentially a house-dwelling mosquito. The breeding places are frequently near or even inside human dwellings. If the temperature conditions are favorable, this species will breed even during the winter.—J. Bequaert, Museum of Comparative Zoölogy, Cambridge, Mass.

A NEW MACROSIPHUM FROM ZION NATIONAL PARK.

By George F. Knowlton, Utah State Agricultural College,
Logan, Utah.

This report deals primarily with an apparently undescribed aphid, taken upon *Aster canescens* var. *viscosus* A. Gray (= *Machaeranthera viscosa*) collected at Zion National Park. Host and occurrence records also are given for some additional species of *Macrosiphum*.

Macrosiphum zymozionensis, n. sp.

Alate vivipara: Color green (?); body 1.95 to 2.1 mm. long and 0.71 to 0.9 wide cross abdomen; 0.43 to 0.45 wide through eyes; body and appendages armed with prominent hairs; antennae 1.7 to 1.79 mm. long, largely dusky; antennal III, 0.49 to 0.54 with 31 to 42 wide-rimmed, circular tuberculate sensoria, largely in double rows; IV, 0.316 to 0.38, with 3 to 6 sensoria in a row; V, 0.27 to 0.284, without secondary sensoria; VI, 0.11 to 0.123 plus 0.335 to 0.364; prothoracic and mesothoracic tubercles present; cuticle of thorax and fore-part of abdomen somewhat rugulose; rostral IV + V, 0.14 to 0.15 mm., slenderly obtuse, sides nearly parallel beyond apex; hind tibiae 1.25 to 1.37; dusky towards end; hind tarsi 0.094 to 0.1; wing venation normal (except one front wing media is 3-branched); cornicles robust, 0.456 to 0.616, reticulated on distal 0.10 to 0.14 mm. before flange, dusky beyond basal one-fifth; cauda pale, narrow beyond broader basal half, somewhat uneven sided, with 4 to 5 hairs on each side and 2 or 3 dorsal hairs.

Apterous vivipara: Color green (?); antennae dusky beyond about basal one-fifth of III; distal portions of legs dusky; body length 2.31 to 2.58 mm. long; 1.29 to 1.37 cross abdomen; antennae 1.72 to 1.88; antennal III, 0.52 with 9 to 25 sensoria (average 15.6); IV, 0.32 to 0.363, without sensoria; V, 0.27 to 0.3; VI, 0.11 to 0.126 plus 0.33 to 0.411 mm.; rostral IV + V, 0.15, scarcely reaching metathoracic coxae; hind tibiae 1.36 to 1.45; hind tarsi 0.095; cuticula of thorax and fore part of abdomen somewhat rugulose; cornicles strong, 0.64 to 0.72 mm. long with about 0.10 to 0.17 reticulated, beyond imbrications, the distal three-fourths dusky; cauda pale, 0.33 to 0.345 long with 4 or 5 lateral hairs on each somewhat irregular side; tip of cauda tends to be pointed.

(A single small, less typical apterous specimen is only 1.67 mm. long; 0.87 wide through abdomen; with antennae 1.69. Antennal III, 0.458 with 8 to 9 sensoria; IV, 0.3; V, 0.268; VI, 0.12 plus 0.35; cornicles 0.506; cauda 0.3; hind tibia 1.07; hind tarsi 0.095 mm.)

Collections: Abundant on *Aster canescens* var. *viscosus* (= *Machaeranthera viscosa*) at Zion National Park, Utah, July 10, 1925, by G. F. Knowlton. Abundant toward apex of stems and a few on leaves. A large percentage were attacked by internal parasites.

Taxonomy: Macrosiphum zymozionensis, n. sp., runs to *Macrosiphum katonkae* Hottes in Gillette and Palmer's key (Ann. Ent. Soc. Amer. 27: 169–170, 1934), from which it differs in having much shorter hind tibiae, hind tarsi, antennae and antennal segments generally. It differs from *Macrosiphum tenuitarsis* G.-P. in generally lighter color of appendages, shorter hind tibiae, tarsi scarcely half as long, and shorter antennal joints, more tuberculate sensoria, and more slender rostral IV + V.

Macrosiphum aetheocornum S.-K. On wild *Geranium,* Allen's Canyon, Utah, July 21, 1942 (Knowlton)[1]; and Card Canyon, Utah, June 16, 1940 (Knowlton-W. P. Nye).

M. albifrons Essig. On *Lupinus,* near summit of Teton Pass, Wyoming, September 13, 1941; North West of Reno, Nevada, July 23, 1944; Ashton, Idaho, July 30, 1936 (T. O. Thatcher); near San Luis Obispo, California, April 19, 1945; Beaver Canyon and Beaver Mt., Utah, July 10, 1942; Radcliffe and Bend, Oregon, August 24, 1944; and Puyallup, Washington, June 19, 1939 (Knowlton) and June 30, 1939 (the late Ensign H. C. Bennion); La Sal Mts., Utah, July 28, 1938; Yarnell, Arizona, May 11, 1945.

M. ambrosiae var. *solidaginis* (Fab.) on *Solidago canadensis,* Plan City, Utah, June 3, 1935.

M. coweni (Hunter) is very abundant in Utah on *Artemisia tridentata,* in many localities. Collected at Laketown, Utah, July 28, 1926; Clifton, Idaho, June 21, 1935; Wells, Nevada, August 16, 1945.

M. dirhodum (Walker) on wild and tame *Rosa,* at Salt Lake City, Utah, October 9, 1929; Horse Tail Falls, along the Columbia River, Oregon, June 20, 1939; on grass, *Elymus,* at Jackson, Wyoming, September 13, 1941; on oats, Bozeman, Montana, August 15, 1926 (C. B. Philip); on rose and grass at Moab and Farmington, Utah.

M. erigeronensis Thomas on *Gutierrezia,* Blacksmith Fork Canyon, Utah, October 6, 1927 (Knowlton; Det. M. A. Palmer).

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[1] Unless otherwise indicated, collected by G. F. Knowlton; K. = Knowlton.

M. escalanteii Knlt. on *Chrysothamnus nauseosus* in Utah at Monte Cristo, Randolph and Allen Canyon, August 25, 1938; Caldwell, Idaho, June 17, 1939; Wells and Snowwater Lake, Nevada, August 20, 1943; Cache La Poudre River, Colorado, July 12, 1942. On *Chrysothamnus viscidiflorus* at Pleasant Valley, Oregon, June 17, 1939; and on rabbitbrush at Ontario and Sisters, Oregon, August 24, 1944.

M. euphorbiae (Thomas) on *Euphorbia marginata,* on apical tips and leaves, Logan Canyon, Utah, June 23, 1925.

M. gaurae Williams on *Oenothera* at Farr West, Utah, July 15, 1938; and Millville, Utah, July 2, 1937; on *O. biennis,* Zion National Park, Utah, July 10, 1925; Puyallup, Washington, July 4, 1937 (the late H. C. Bennion); Twin Falls and Murtaugh, Idaho, October 1930 (D. E. Fox); Panguitch, Utah, July 14, 1925.

M. granarium (Kirby) was damaging heads of wheat at Richfield, Utah, July 20, 1936; on grass at Baker, Oregon, June 17, 1941; Snowwater Lake, Nevada, August 20, 1943; Flagstaff, Arizona, September 23, 1944; Cascade, Montana, August 3, 1944; Spokane, Washington, August 9, 1944.

M. jonesi G.-P. abundant on *Artemisia* at Monte Cristo, Utah, August 25, 1938 (Knowlton-D. E. Hardy); reared parasites of this were *Trioxys c. coruscanigrans* Gahan (Det. C. F. Smith).

M. laevigatae Essig on *Salix* at Wolf Creek Pass, Utah, July 24, 1945; Basin, Wyoming, September 12, 1491. A wingless specimen of this aphid was being fed on by a pirate bug, *Anthocoris melanocerus* Reuter, in Provo Canyon, Utah, July 26, 1945; west of Elco, Nevada, August 16, 1945.

M. ludovicianae (Oestlund) on *Artemisia vulgaris* and *A. ludovicianae,* taken at Provo Canyon, Utah, July 26, 1945 (Knowlton); Teton Pass, Wyoming, September 13, 1941; Burley, Idaho, June 16, 1939; Flagstaff, Arizona, 1944; 9 miles North West of Reno, Nevada, August 21, 1945.

M. nigromaculosum MacD. on *Rosa,* Lonetree, Wyoming, August 14, 1942; Yakima, Washington, July 27, 1937 (H. C. Bennion).

M. packi Knlt. on *Chrysothamnus nauseosus* at Elk Springs, Colorado, August 18, 1935; Circleville, Utah, July 10, 1942; Emigrant Pass, Nevada, July 24, 1944; Ririe, Idaho, September 13, 1941.

M. pseudorosae Patch, on *Rosa,* Amalga, June 22, 1925, and Emigration Canyon, June 21, 1925; Granite, June 6, 1935, in Utah; wild rose, Boise, Idaho, June 16, 1939.

M. rosae L. on garden roses at Big Cottonwood Canyon, Utah, June 25, 1925; Bear River City, Utah, June 4, 1938; Portland, Oregon, June 19, 1939; Overton, Nevada, May 20, 1935.

M. schranki Theob. on *Urtica gracilis* at Wanship and Oakley, Utah, June 13, 1941; Preston, Idaho, October 21, 1942.

M. sporadicum Knlt. on *Chrysothamnus nauseosus* at Brigham Canyon, Utah, July 3, 1928.

M. stanleyi Wilson on *Sambucus,* Logan Canyon, Utah, August 1, 1941; Indian Canyon and Monte Cristo, Utah.

M. taraxaci (Kalt.) on *Taraxacum officinale,* abundant in mouth of Blacksmith Fork Canyon, Utah, October 10, 1938, and at Paragonah, Utah, August 1942; Flagstaff, Arizona, September 23, 1944; Conrad, Montana, October 26, 1936 (rec. from H. B. Mills); Baker, Oregon, June 17, 1939.

M. zerogutierrezis S.-K. on *Gutierrezia,* Emigrant Pass, Nevada, July 24, 1944; Kingman, Arizona, May 16, 1945; Smithfield, Utah, October 4, 1927.

M. zerozalphum Knlt. on *Erodium cicutarium* at Ogden, Utah, May 5, 1938, with one being fed on by a *Geocoris decoratus* Uhler at North Ogden, Utah, May 3, 1938; Peach Springs, Arizona, May 8, 1945.

CORRECTION OF NAME OF TORTOISE BEETLES (COLEOPTERA, CHRYSOMELIDAE).

By H. S. Barber, Washington, D. C.

Invalidity of the generic name *Orectis* as applied to tortoise beetles, because the same name was previously proposed for a genus of moths, was not recognized in my note on a new form from Texas on p. 102 of this Bulletin. The subgeneric name *Parorectis* Spaeth, 1901, automatically becomes the generic name replacing the homonym, but correction of the synonymy in the following form seems to be needed.

Parorectis Spaeth, 1901: 346.
  Synonym *Orectis* Spaeth, 1901: 346 (not Lederer, 1857).
  Sp. 1 *callosa* (Boheman, 1854: 471) Texas, Florida, South Carolina.
  Sp. 2 *sublaevis* (Barber, 1946: 102) Texas.
  Sp. 3 *rugosa* (Boheman, 1854: 472) Mexico.

DDT—A NEW WEAPON IN INSECT CONTROL.*

By George S. Tulloch, Brooklyn, N. Y.

Among the major scientific achievements of World War II are the remarkable advances made in the control of insect-borne diseases. Perhaps the most important single accomplishment in this field has been the development of DDT. The amazing ability of this chemical to kill insects when used in very minute amounts, its effectiveness against many different kinds of insects and its prolonged lasting effect when applied to surfaces with which insects may come in contact have modified the methods of control of many insect pests and disease vectors.

DDT was first synthesized by a German chemist in 1874 but its insecticidal properties were not noted until 1939 when a Swiss worker reported its effect on flies, clothes moths and plant lice. The Bureau of Entomology and Plant Quarantine received a sample of this material in November, 1942. It was obtained from the J. R. Geigy and Co. and was known as Gesarol. This organization soon recognized its enormous potentialities and a large staff of investigators were assigned to study its applicability against those insects which were of military importance (flies, mosquitoes, lice, fleas, etc.). A training program was instituted by the Bureau of Entomology and Plant Quarantine at Orlando, Florida, where large numbers of Army and Navy personnel were instructed in the uses of DDT.

DDT (dichloro-diphenyl-trichloroethane) is a fine white powder which has a very slight odor which might be likened to that of sweet cider. It has a definite tendency to lump in an unadulterated state. It does not deteriorate when exposed to sunlight or the atmosphere and it does not evaporate. Its physical properties are such that it can be dispersed either in oil solutions, in emulsions, in diluted dusts, in aerosol or in smokes. The method by which it works on the insect is not understood. Shortly after exposure the insects become noticeably restless, then muscular incoordination sets in and finally they develop tremors and die.

DDT does not repel insects. Insects entering an area which has been treated act as they would if DDT were absent. However, after a five or more minute exposure they become restless and attempt to escape and they may move away from the area in which they first contact the DDT. Some, like mosquitoes, may move toward the light while others, such as cockroaches, may seek darkness. Because of this movement after contact, few dead insects are encountered in the treated area. This fact is important from the viewpoint of public relations because the average householder or user may expect to see a large number of dead insects in the treated area. Because of the absence of dead insects they only get a false idea as to the effectiveness of this insecticide.

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* A report given at the meeting of the Brooklyn Entomological Society on March 14, 1946. The material was obtained from many sources but principally from the publications of the U. S. Public Health Service and the Bureau of Entomology and Plant Quarantine.

Extensive experiments to determine the usefulness of DDT as a larvicide in the control of anopheline mosquitoes were conducted by the Orlando station of the Department of Agriculture. It was found that by dissolving DDT in diesel oil to make a 5% DDT solution a most desirable larvicide was obtained. This material applied in such a way that one tenth of a pound of DDT is spread over one acre of water surface gives satisfactory control of anopheline larvae. Before DDT was available the usual procedure was to use diesel oil for this purpose. Large quantities were required which entailed considerable expense for the material as well as labor. With a 5% DDT-diesel oil solution much smaller quantities of material are needed which reflects a lower labor cost for application. One pint of 5% DDT-diesel oil solution does as much good in anopheline control as 20–25 pints of diesel oil.

DDT also has been found useful in the control of adult mosquitoes, particularly the anophelines or malaria vectors. A 5% DDT oil solution painted or sprayed on walls and ceilings of houses will provide an effective lethal contact which may have a residual effect of several months. Actually the oil evaporates and leaves behind the DDT in microcrystal form which the mosquito contacts when alighting on a treated surface. The first knockdown with this method usually occurs in 10–20 minutes and by 30 to 90 minutes the kill is largely complete. The U. S. Public Health Service is now carrying on an extended malaria control campaign in the southern states and DDT is playing an important part in this program.

The use of DDT in the control of lice has been carried on in many parts of the world. Here the DDT is used in powder form being diluted with talc or some other similar compound to yield a 5 or 10% DDT dust. The effectiveness of DDT as an insecticide for lice was demonstrated in Naples early in 1944 at a time when typhus fever was epidemic.

There are many other insects which are susceptible to the toxic effects of DDT. Experiments are in progress to further extend the usefulness of this new insecticide and to develop new methods for its application by use of mists and smokes.

NEW ACANALONIIDAE FROM MEXICO (HOMOPTERA).

By John S. Caldwell, Circleville, Ohio.

Acanalonia tehuacana n. sp.

Length of female 4.5 mm. General color green with legs and clypeus (anteclypeus of Doering) brownish yellow.

Vertex produced, forming about a 45° angle, longer than pronotum; lateral margins slightly divergent cephalad. Front upright with lateral margins parallel; median carina obscure. Pronotum narrow; posterior margin straight. Mesonotum ecarinate. Elytron with costal margin rounding from apex for half its length, thence sloped straight toward base; apical margin gently convex; M_{3+4} long, branched at half length.

Last ventral segment of female with three projections on posterior margin; intermediate projection heavier than lateral and less acute apically.

Female holotype and five paratypes, Tehuacán, Puebla, 10–7–41 (DeLong, Good, Caldwell & Plummer).

Resembling *immaculata* Kirk. but smaller and with the last ventral female segment trifurcate caudad.

Acanalonia humeralis n. sp.

Length of male 3.6 mm.; female 4.5 mm. General color dusky green, with male more deeply colored than female.

Head scarcely produced before the eyes; cephalic margin straight in dorsal aspect, slightly concave in frontal aspect. Face broadly expanded before clypeus, with a prominent median carina and indications of intermediate carinae basad. Elytra broadest at midlength, hemispherical except for basal half of costal margins (and sutural margins); venation prominent; reticulation regular, not dense.

Last ventral segment of female broadly concave posteriorly, with a broad tooth in center of concavity.

Female holotype and two paratypes, male allotype and one paratype from 20 miles east of Saltillo, Coahuila, 9–27–41 (DeLong, Good & Caldwell).

Differing from any known species of acanalone by having the basal half of the costal margin almost perpendicular to the apical half.

Acanalonia albacosta n. sp.

Length of female 10 mm.; elytron 9 mm. long, greatest width 6 mm. Green, with basal third of costa white.

Profile rounding from pronotum to labrum. Face not expanded toward clypeus, with indications of medium and intermediate carinae. Head scarcely produced before eyes. Elytra of same general shape as those of *latifrons* Walk.; costa expanded, deflexed basad; a bump-like area present on either elytron between M & R at the furcation of M.

Last ventral segment of female broadly produced posteriorly with a broad, semicircular, median notch in produced area.

Female holotype and three paratypes, Tehuantepec, Oaxaca, 10–13–41 (DeLong, Good, Caldwell & Plummer).

This species differs from the other acanalones by the peculiar raised areas on the elytra.

Acanalonia tripartita n. sp.

Length of male 8 mm.; female 8.5 mm. General color of male light green, female dark green; pronotum in either sex yellowish.

Head produced in front of eyes a distance equal to width of pronotum; profile angular. Face longer than broad; lateral margins parallel. Elytra about the shape as those of *virescens* Stål but longer; veins prominent; costa narrow; length of M equal to length of M_{3+4}.

Last ventral segment of female with three spurs on posterior margin. Forceps of male long, slender.

Female holotype, male allotype, eight female paratypes, Tamazunchale, San Luis Potosí, 8–29–39 (DeLong). One male paratype, Valles, San Luis Potosí, 9–24–41 (DeLong, Good & Caldwell). Four female and two male paratypes, Tamazunchale, San Luis Potosí, 11–1–45 (DeLong & Hershberger).

Resembling *tehuacana* n. sp. but twice as large a species.

Specialization—Among the orders recently received for publications of the Society was "Böving and Craighead, Larvae of *Cleopatra*."

APHID FIELD NOTES.

By George F. Knowlton, Utah Agricultural College, Logan, Utah.

Pemphigus Aphid Notes.—Some of the identifications listed below were made by my friends, Professor M. A. Palmer and A. C. Maxson.

Pemphigus balsamiferae Wms. on *Populus angustifolia,* Brigham Canyon, Utah, June 20, 1930; on *P. balsamifera* at Nephi, Utah, October 1942; in stomach of the small lizard, *Uta stansburiana stansburiana* (B.–G.), near Oak City, Utah, September 28, 1941; in *Populus* galls, Farmington, July 1940; Logan Canyon, July 11, 1937 (Knowlton-W. P. Nye).

P. betae Doane, on roots of *Rumex acetosella,* Forest Grove, Oregon (among wheat stubble), October 9, 1919 (A. C. Burrill); on *Populus* trunk, Pullman, Wash., Sept. 26, 1918 (Burrill); accidental in spiderweb on raspberry leaf, Lakeview, Utah, June 5, 1930; Berger and Burley, Idaho (D. E. Fox); *Chenopodium album* roots, Roosevelt, Utah, September 4, 1945.

P. bursarius (L.), on roots of head-lettuce, 35 miles South of Bozeman, Montana, September 10, 1940 (Mills and Cowan; Det. M. A. Palmer).

P. populi-caulis Fitch in galls on *Populus sargentii,* Grafton, Utah, June 18, 1935; Granite, Utah, on *Populus,* June 15, 1937; causing poplar leaves infested with galls, to fall prematurely at Bountiful, Centerville, Clinton, and Trenton, Utah, during August of 1940. *P. sargentii* damaged by this species and more severely by *Mordvilkoja vagabunda* (Walsh) at Richfield, Utah, July 25, 1941 (W. E. Peay-H. C. Bennion); Basin, Wyoming, September 12, 1941.

P. populi-ramulorum Riley in twig galls on *Populus sargentii* at Clinton, Utah, July 15, 1937 (Knowlton-C. F. Smith); Trenton, Utah, July 1, 1940; Basin, Wyoming, September 12, 1941, typical galls.

P. populi-transversus Riley in petiole galls on *Populus sargentii* and *P. deltoides,* causing affected leaves to fall prematurely, at Bountiful and Trenton, Utah, August 17, 1941; Grand Haven, Michigan, August 14, 1936 (H. G. Strom).

P. populi-verae Fitch in pocketlike leaf galls on *Populus angustifolia* at Mt. Emmons, Utah, August 17, 1937; Brigham City and Boxelder Canyon, Utah, June 22, 1932.

Pemphigus sp. on root of *Poinsettia,* Ardmore, Okla., December 8, 1937 (G. A. Bieberdorf).

Aphid Observations.—Several colonies of *Clavigerus smithiae* (Monell) were examined on willow, near Riverdale, Utah, on October 3, 1942. A two-spotted ladybird beetle, *Adalia bipunctata* (L.), was observed to be feeding on an immature specimen. Several *Anthocoris musculus* (Say) and three additional species of ladybird beetles also were present among the twig-infesting aphids.

An apterous *Capitophorus palmerae* Knlt. on *Chrysothamnus* at Truckee, California, June 23, 1944, was observed to be attacked by a *Nabis ferus* (L.). This aphid was moderately abundant on rabbitbrush.

Pea aphids, *Macrosiphum pisi* (Kalt.), were moderately abundant on sweet-clover in a shady orchard at Lehi, Utah, September 14, 1943. Examination of several plants revealed a *Nabis alternatus* Parsh. feeding on a mature apterous *pisi.*

A wingless *Pseudoepameibaphis essigi* K.–S. on *Artemisia tridentata* at Wadsworth, Nevada, July 23, 1944, was being fed on by an *Orius tristicolor* (White).

At Bend, Oregon, on August 24, 1944, the writer observed an *Orius tristicolor* on *Artemisia tridentata* to be feeding on a tiny *Flabellomicrosiphum tridentatae* (Wilson). This tiny predator was very abundant on nearby, blossoming *Chrysothamnus viscidiflorus,* the flowers of which were teeming with western flower thrips.

Neorhynchocephalus volaticus (Williston) in Lower California (Diptera, Nemestrinidae).—I have recently received from the California Academy of Sciences (through Dr. E. S. Ross) specimens of *N. volaticus* collected by E. S. Ross and G. E. Bohart, in October, 1941, at the following localities in Lower California: 10 miles northwest of La Paz; San Venancio; Canipole; and Las Animas, Sierra Laguna. These localities extend the range of the species somewhat farther west. Compare the records I published in 1930 (Psyche, XXXVII, pp. 290–291) and 1934 (Jour. New York Ent. Soc., XLII, pp. 166–167). I have seen since a specimen from Valerio Trujano, State of Oaxaca, Mexico, at 4,500 ft. (collected by M. Embury). The Lower California specimens differ in no way from those I have seen from elsewhere. It is strange that the species has not yet been taken in California proper, so far as I know.—J. Bequaert, Museum of Comparative Zoölogy, Cambridge, Mass.

THE MATING BEHAVIOR OF TACHYTRECHUS VORAX, T. MOECHUS, AND GYMNOPTERNUS BARBATULUS (DIPTERA, DOLICHOPODIDAE).

By George C. Steyskal, Detroit, Michigan.

Apparently the epigamy of no species of the genus *Tachytrechus* has previously been observed. The genus is rather closely related to the great genus *Dolichopus,* the epigamy of several species of which has been described. *Tachytrechus* is represented in North America by sixteen species, according to the latest revision (C. T. Greene, Proc. U. S. Nat. Mus., Vol. 60, Art. 17, 1922), to which work the reader is referred for a physical description of the species. The present writer was fortunate in being able to observe the behavior of *Tachytrechus vorax* Lw., the commonest American species, and *T. moechus* Lw., a less common species. Notes on *Gymnopternus barbatulus* Lw. are also presented at this time.

Tachytrechus vorax Loew.

This species was watched on many occasions in various places, but the first time any definitely epigamic behavior was observed was on the shore of Georgian Bay at Croker Bay on the Bruce Peninsula, Ontario, on June 2, 1946. The temperature was in the sixties (F.) and had been much lower on the previous few days. The flies were abundant among sedges in a narrow, shallow strip of water paralleling the shore line between the sandy beach and the heavily wooded higher land. They were easy to watch on a few limestone flags which served as stepping stones where a road came down to the beach.

The male crept stealthily toward the female, holding his body very low. When he was about three inches away, the female took notice and turned to face him. He then began to shift his body from side to side a few times, still approaching her. When he was about two inches from her he held his wings at right angles to his body and fluttered them very rapidly for a few seconds, then almost immediately began to fly over the female from side to side, landing first about three inches to one side of her and then an equal distance to the other side. After about three landings on each side he quickly mounted her and apparently effected a union, all the while rapidly beating his wings. After about 45 seconds he folded his wings and remained still for about a minute, when observations were interrupted.

The "hopping" over the female was observed at other times and places, but the other features of the epigamy were not seen previously.

Tachytrechus moechus Loew.

This species was observed at Elkmont, Tennessee, in the Great Smoky Mountains National Park, on June 17, 1946, at about ten o'clock of a rather cool morning after a rainy night which had left the vegetation very wet. The flies were disporting on the mud and water of a little rill flowing down a rut in a side road. The male followed the female about, a short distance in front of her, facing her with his wings fluttering at right angles laterad of the body. The short, shining white fore tarsi were extended forward and rather slowly waved a bit. The females paid no attention to the display and no successful copulation was observed. The male of this species has a long antennal arista tipped with a black lamella, but neither the arista nor its lamella could be seen against the dark substratum.

Gymnopternus barbatulus Loew.

At a small spring in Deerfield Township, Lapeer County, Michigan, on several dates in June and July, 1946, this little fly was observed in great abundance on the muddy seepage area among *Polygonum* and grasses and sedges where the treading of cattle had torn up the soil somewhat. The fly has no especial secondary sexual modifications, but both sexes have rather dark (brownish gray) wings. The male faces the female at any distance from one to several times his length from her and flashes his wings several times, rapidly extending them simultaneously to a horizontal position at right angles to the body. He then usually attempts to copulate. Sometimes he hops about a bit and flashes his wings from several different positions. On a few occasions the male was seen to bounce on the female several times, alighting on her back, immediately rising a short distance, and then alighting on her again. The females were not receptive and no copulation was observed.

W. Junk.

We are much pleased to note from an announcement of publications recently received, that those old and favorably known publishers and booksellers, are once more active and productive in their specialized fields. The address of the firm is at present "Amsterdam –C, N. Z. Voorsburwal 64," Holland. The firm bears the name, but Dr. Junk, as we noted long ago, was one of the victims of the war.—J. R. T.–B.

BOOK NOTES.

General Catalogue of the Hemiptera. Fascicle IV, Fulgoroidea. Part 8, Dictyopharidae. By Z. P. Metcalf. Pp. 1–246. 1946. Smith College, Northampton, Mass. (Price, $3.00.)

This great catalogue, in the face of so many obstacles, continues on its way slowly but steadily. And here we have the fourth with the continuation of the roster of the important and widespread Tribe Fulgoroidea, in this eighth part on the Family Dictyopharidae, by Dr. Z. P. Metcalf.

The short introduction defines the family, sets forth the classification, gives a brief historical résumé, an equally abridged notice of the geographical distribution; and, finally, comment on the form of the Catalogue.

The author says (Introduction, pp. 6 & 7):

"A catalogue is not a revision of a group, and the location of the genera and species in the present catalogue is merely an attempt to reflect what is believed to be the general consensus of the best authorities of the present time. Doubtful genera and species have been included to call them to the attention of subsequent revisers.

"An attempt has been made throughout this catalogue to interpret all references in the light of the period in which they were published. This is not always easy and leads perhaps to erroneous conclusions at times, but it is certainly much sounder from the standpoint of nomenclature than the tendency to evaluate references from previous decades in the light of present day practices and procedures."

In this spirit all catalogue work should be approached; and all interpretation of the work of the older authors should be made.

As always, our warmest congratulations go to Dr. Metcalf on the results of intensive labors in a difficult, tedious and thankless task.

General Catalogue of the Hemiptera. Fascicle V, Polyctenidae. By R. L. Usinger. Pp. 1–18. 1946. Smith College, Northampton, Mass. (Price, $0.60.)

This is indeed a short part, but of great importance for it is the primary concentration as an ordered whole of this very small Family of the Heteroptera, since it was established in 1874 by John Obadiah Westwood. Its proper systematic position was cleared up only so recently as 1904. This highly aberrant Family of the Heteroptera, parasitic on bats, contains up to the date of this catalogue only 19 species, for few entomologists have occasion to examine live bats.

The Bibliography enumerates 43 titles.

Dr. Usinger merits the gratitude of entomologists for his painstaking and very useful work.

J. R. T.-B.

Practical Malariology, by Paul F. Russell, Luther S. West and Reginald D. Manwell. xiii + 694 pp., 238 illustrations, 8 in color. 6 × 9 ins., cloth bound. 1946. W. B. Saunders Company, Philadelphia, Pa. (Price, $8.00.)

This book, which was prepared under the auspices of the Division of Medical Sciences of the National Research Council, is one of a series of military medical manuals. Its preparation was undertaken during the closing months of World War II and it was completed during the post-war period. It is written primarily from the standpoint of civilian needs and, therefore, is not a military manual in a restricted sense.

Following an historical account given in the first chapter (24 pages) the subject matter is divided into six sections, each of which deals with an important phase of malariology. The following table indicates the sections and the chapters and pages devoted to each.

Section		Number of chapters	Number of pages
I.	The Parasite	4	93
II.	The Mosquito	5	151
III.	Man	5	70
IV.	The Community	4	65
V.	Prophylaxis and Control	9	174
VI.	Therapeutic Malaria	1	9

In an appendix there are keys to the Anophelines of the World and a table of equivalents.

The section on Prophylaxis and Control will be of interest to all workers concerned with the control of mosquitoes. Although specifically directed to the control of anopheline mosquitoes many of the methods are applicable to non-anopheline species. The use of DDT for the control of larvae and adults is fully covered.

George S. Tulloch, Brooklyn, New York.

EDITORIAL.

Responsibility of the Free Individual.

Since their very inception, the several publications of the Brooklyn Entomological Society have had a settled editorial policy with regard to articles accepted for publication. This policy has been and is that all articles are personal to their authors, who are responsible in every way, and who present their own personal views and findings. In no sense have our publications allowed themselves to be institutional sounding boards. In brief words, we have maintained in full force in our publications the freedom of scientific opinion and its independence from all institutional rules and censorship. We have always deemed the scientific worker, great or small, has the complete right to present to his fellows his findings, facts or opinions undiluted by censorship in any form, whether open or hidden. Every worker in any science has only one court in which he may be judged; and that court is the informed and considered, mark it, *considered,* opinion of his competent fellows.

This is the principle on which our publications are edited—the full freedom and the full responsibility of a scientific worker; not of the institution in which fate has placed him, nor its ideas, nor its notions, nor its pettifogging rules. We judge the man by his work, doubtless too fallibly too often. We give room to the unknown man as readily as to the outstanding and established authority.

These remarks spring from the institutional connection recited after the name of so many authors, in our and in so many publications, and in so many of the MSS that come to us; or the note "Published by permission of ————"; or even with the pointed request that the institution on whose staff the writer is must be named, according to the rules of the institution!

We submit that such rules, frequently so petty; and such censorship, frequently so weak, are the first steps toward the enslavement of free science.

For ourselves, we shall not connive in this domination of the free individual by any institution, however worthy and however delusively high its purpose. We shall continue to publish articles received as the free product of the free mind of an individual.

J. R. T.-B.

PROCEEDINGS OF THE SOCIETY.

Meeting of May 16, 1946.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on May 16, 1946.

The meeting was opened at 8: 15 P.M. by Pres. R. R. McElvare.

Members in attendance were Messers. McElvare, Sheridan, Moennich, Teale, Noaks and Drs. Risch and Tulloch. Visitors included Messers. Hessel, Bull and Murphy.

The minutes of the previous meeting were approved as read.

The Treasurer reported that a statement of finances had been sent to the Bureau of Internal Revenue.

Dr. H. K. Svenson of the Brooklyn Botanic Garden was the speaker of the evening and delivered a most interesting lecture on the Geographical Distribution of Long Island plants illustrated with many dried specimens representing most of the genera of the Long Island flora.

In addition to Dr. Svenson's excellent description of the distribution and abundance of plants on Long Island, he gave an interesting outline of the generic characteristics of plants and the geological history of the Island.

Among the plants mentioned by Dr. Svenson were species of the following groups: Orchids, grasses, small plants and trees, and berries, including the rarely found "cloudy berry," which has been seen only once on Long Island.

Dr. Svenson also mentioned host and parasitic relationships between plants and insects.

The meeting adjourned at 10: 15 P.M., following a general discussion.

John W. Noaks, *Secretary.*

Meeting of October 10, 1946.

A regular meeting of the Brooklyn Entomological Society was held at the Brooklyn Museum on October 10, 1946.

The meeting was called to order at 8: 05 P.M. by President R. R. McElvare.

Members in attendance were Messers. McElvare, Teale, Nicolay, Sheridan, Naumann, Buchholz and Tulloch.

The minutes of the meeting of May 16, 1946, were read and accepted.

The Treasurer presented a report on the financial status of the Society for the second and third quarters of 1946.

The Society voted to contribute the sum of approximately five dollars to the organization responsible for the publication of the Zoological Record.

The Program Committee reported that Mr. Otto Buchholz would be the speaker at the November meeting.

The program of the evening was devoted to reports by members of summer activities.

Mr. Teale reported an observation dealing with the phenomenon of "anting." At Baldwin, Long Island, birds were observed picking ants from the ground and placing them in their feathers. The reason for this action is not known but it is believed to be concerned with the destruction of lice (Mallophaga) which are so common on birds. Some believe that the ants are placed amongst the feathers and there seek out and destroy the lice. Others believe that the ants are crushed by the bill of the bird and the formic acid which is liberated is rubbed into the bases of the feathers and there exerts an insecticidal action.

A second observation by Mr. Teale dealt with swarming activities of ants. Near a high bluff overlooking the ocean at Cape Cod swarming flights were noted at the time of an offshore breeze. As the ants passed over the top of the bluff they settled to the ground and there were present in large numbers.

Mr. Teale also reported on the relation between tiger beetles and sowbugs. These beetles may approach sowbugs as if to attack but apparently are repelled by some substance which emanates from the sowbugs.

Mr. Naumann reported on his activities in connection with several nature organizations in New Jersey.

Mr. Buchholz reported briefly on his trip to the southeastern United States.

Mr. McElvare exhibited a copy of the monograph on the Aegeriidae which was prepared by the late George P. Engelhardt.

Mr. Tulloch presented a review of the book *Practical Malariology.*

The meeting adjourned at 10:00 P.M.

George S. Tulloch, *Secretary pro tem.*

NOTICE TO SUBSCRIBERS.

The publications of the Brooklyn Entomological Society face the difficulties of enhanced costs, as everyone else. We find ourselves compelled by a recent heavy increase in our printing bills to raise our subscription price to both our *Bulletin* and *Entomologica Americana.* The Bulletin subscription price, beginning with the volume XLII, for 1947, will be $3.50 per year, or volume (foreign $3.75). Entomologica Americana will be priced at $5.00 for the volume, starting with volume XXVI, just gone to press.

Very naturally as a non-profit scientific society, we greatly regret these increases, which are made under compulsion. We would, however, point out the pertinent facts. When we revived the Bulletin in 1912, our printing cost was fifty cents ($0.50) per page; the new increase makes our printing cost close to $3.50 per page, an increase of 600% in this time! Three times we have increased our subscription, but not in direct relation to the increased cost, nor each time these costs have been raised. With regard to *Entomologica Americana,* we have maintained the original subscription price of $4.00 for the volume, although in the 25 years we have been publishing this our costs have gone up 75%. We point out these facts for the record.

Publication Committee
Brooklyn Entomological Society.

July 18, 1946.

EXCHANGES AND FOR SALE.

This page is limited to exchange notices and to small For Sale advertisements from members of the Society and from actual paid subscribers to the Bulletin exclusively. *Exchange notices* from members of the Society and from subscribers are limited to *three (3) lines each,* including address; beyond 3 lines, there will be a charge of $1.00 for each 3 lines or less additional. *For Sale* ads will be charged at $1.25 for each 3 lines or part of 3 lines. *Commercial or business* advertisements will not be carried in this page, but will go in our regular advertising pages at our regular advertising rates to *everybody.*

PENTATOMIDAE: Want to buy or exchange Pentatomidae from the United States and Mexico. Herbert Ruckes, College of the City of New York, 17 Lexington Ave. N.Y.C.

ACALYPTRATE DIPTERA OF THE WORLD wanted for determination or in exchange for other insects. Geo. Steyskal, 23341 Puritan Ave., Detroit, Mich.

WANTED.—MANTID EGG CASES from West of the Mississippi River. If interested in collecting, write: Osmond P. Breland, The University of Texas, Austin, Texas.

WILL PURCHASE complete sets of the BULLETIN, Old Series, Vols. 1–7, 1878–1885. Brooklyn Entomological Society, Ivy Way, Port Washington, L. I., N. Y.

LEPIDOPTERA AND ORTHOPTERA from Florida in papers and local specimens mounted to exchange for other Lepidoptera. —Alex K. Wyatt, 5842 N. Kirby Avenue, Chicago (30), Ill.

"LEPIDOPTERISTS! Drawer front labels 2 7/8″ × 1 6/16″ on white-faced board at cost! Non-profit! Don't delay, write today! Kent H. Wilson, 430 Ridgewood Rd., Fort Worth 7, Texas."

WANTED—Geometrid moths, for cash or exchange. John L. Sperry, 3260 Redwood Drive, Riverside, Calif.

CERAMBYCIDAE AND CHRYSOMELIDAE from Asia and Pacific desired for determination; purchase; exchange.—J. Linsley Gressitt, Lignan University, Canton, China.

FOR COLEOPTERA OF THE WEST INDIES and Chrysomelidae of the world, will collect entomological material from Cuba, by previous arrangement. Am interested in buying literature in the above-mentioned classes, and would be glad to be advised by individuals or institutions of such articles; or to send them to me. Manuel Barro, Calle 12, no. 220, altos, apto. 3, Vedado, Habana, Cuba.

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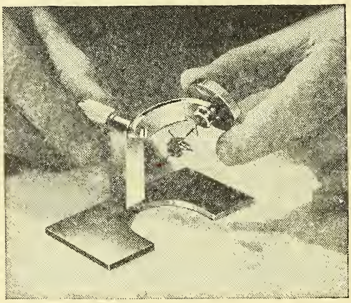

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